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ANAXIMANDER'S BOOK, THE EARLIEST KNOWN GEOGRAPHICAL TREATISE.

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ANAXIMANDER'S BOOK, THE EARLIEST KNOWN GEOGRAPHICAL TREATISE.[1]

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Anaximander of Miletus is admittedly one of the foremost figures in the history of thought, and much has been written about him. He remains, however, somewhat enigmatical, and the obscurity which invests his character involves in some measure the entire line of early Milesian thinkers. When one considers the commonly accepted view regarding Anaximander one can hardly escape the impression that it is somewhat incongruous if not wholly inconsistent.

That he wrote a book is not called in question, though one is not sure whether he or Pherecydes is to be credited with writing the earliest prose treatise in Greek. Anaximander is generally called a 'philosopher' and his book is supposed to be properly described by its traditional title *On Nature*. No disposition has been shown to doubt that he was sufficiently interested in geography to prepare a map of the earth, which made a deep and lasting impression, insomuch that it may be said to have fixed the type, preserved with successive enlargements, refinements, and modifications, to be sure, but essentially the same, until in the Alexandrian Age various attempts were made to adjust its outlines in conformity with the newer conception of the earth as a spheroid. Duly considered this admitted fact would of itself suggest the questions whether Anaximander was not a geographer rather than a philosopher, and whether he must not be presumed to have written a geography in addition to drawing a map. When one finds that he is expressly credited with a geographical treatise in the biographical and bibliographical tradition of the Greeks, one asks why this has been called in question. We have, then, first to canvass the evidence regarding his book and his map.

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1 This essay does not aim to discuss the opinions of Anaximander in detail. So far as his 'philosophy' is concerned, I undertook to do that in Class. Philology, **7** (1912), pp. 212–234. A few minor points I should now judge somewhat differently. With regard to Anaximander's geography and sundry other opinions I believe it is possible to ascertain more than has been suspected; but this cannot be done until the position of Hecataeus shall have been more fully and clearly established. On this I have been at work for ten years with results which I hope sometime to publish. Then, *si dis placet*, I may take up Anaximander anew.

I.

The question regarding Anaximander's book cannot be divorced from that concerning his map. This is not equivalent to saying that the existence of either proves the existence of the other; for maps did exist without accompanying texts, presumably before Anaximander's time; and geographical treatises might, and did in fact, exist without maps. In the case of Anaximander, however, quite apart from general considerations, of which more may be said hereafter, the literary evidence for the geographical treatise is so closely interwoven with that for the chart, that it must all be considered together.

Themistius [2] says that Anaximander was 'the first of the Greeks to our knowledge who ventured to publish a treatise *On Nature*.' [3] This statement, except so far as it bears witness to Anaximander's authorship, deserves no credence; for it belongs to a class of data peculiarly untrustworthy. From early times the Greeks amused themselves by investigating the historical beginnings of various activities and contrivances. These studies gave rise in time to treatises *On Inventions*, [4] and undoubtedly contained much information of value; but pronouncements on matters of this sort are obviously relative to the knowledge of the investigator, and, where the author of a dictum and the sources and limitations of his information are alike unknown, we have no right to accept it as truth. In this instance we may at most conclude that Themistius, or rather his unknown source, did not credit Thales with a treatise *On Nature*.

The entry of Suidas runs thus: "Anaximander of Miletus, son of Praxiades, a philosopher; kinsman, disciple and successor to Thales. He first discovered the equinox, the solstices, and dials to tell the hours, and that the earth lies midmost. He introduced the gnomon (sundial) and, speaking generally, set forth the essential outlines of geometry. He wrote *On Nature, Tour of the Earth, On the Fixed Stars, Sphere*, and some other treatises." For the moment we may pass over all but the bibliographical data. [5] The title *On Nature* we have already

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2 Diels, *Die Fragmente der Vorsokratiker*, 3d edition (hereafter abbreviated V^3) I., p. 15, 16.

3 Περὶ φύσεως. My reasons for retaining this rendering may be found in my essay, Περὶ Φύσεως. *A Study of the Conception of Nature among the Pre-Socratics*, Proceed. Amer. Acad. of Arts and Sciences, **45** (1910), pp. 79–133, hereafter abbreviated Περὶ Φύσεως.

4 Εὑρήματα. No satisfactory discussion of this literary kind as a whole exists.

5 V^3, I. 14, 23 ἔγραψε Περὶ φύσεως, Γῆς περίοδον καὶ Περὶ τῶν ἀπλανῶν καὶ Σφαῖραν καὶ ἄλλα τινά.

met. *Tour of the Earth* was one of the accepted names for a geographical treatise. *On the Fixed Stars* and *Sphere* would be suitable titles for works dealing with astronomy. What account shall we take of this bibliographical index?

In the times of Anaximander and for long thereafter it was not customary for authors to prefix titles to their writings. Such indication as the writer vouchsafed to give of the contents of his book would ordinarily be contained, along with his name, in the introductory sentence, as was done, for example, by Herodotus, more than a century after Anaximander. Ephorus was, apparently the first geographer and historian who divided his work into 'books.' However reasonable the earlier practice may have been for the writer, it was extremely inconvenient for a librarian. The latter required a convenient ticket to attach to the scroll, and hence invented titles where they were not furnished by use and wont. The librarians at Alexandria thus found in current use not only such general titles as *Iliad* and *Odyssey*, but also certain sub-titles referring to episodes or distinct divisions of larger wholes. It is obvious that in the catalogues of the Alexandrian libraries these titles recognized by usage and found in the *testimonia*, particularly regarding rare books or *desiderata*, were duly listed.[6] Hence it might well happen, and demonstrably did repeatedly happen, that one and the same book was represented in the catalogues by various titles.

Now as regards Anaximander we need not pause at present to inquire whether, assuming the essential truth of the bibliographical data furnished by Suidas, he is to be credited with more than one treatise.[7] The title *On Nature*, though in no sense original or really authentic, is admitted by all to apply to a genuine work of Anaximander from which, it is assumed, derive in the last resort the reports of his 'philosophical' opinions, excerpted by Theophrastus and preserved in the form of tablets triturate in the doxographic tradition. Even the most superficial knowledge of such things must suffice to justify the application of such a title as *On the Fixed Stars* to at least a portion of this treatise. As for *Sphere*, it is true that it is not strictly applicable, because there is no adequate ground for thinking that Anaximander spoke of celestial spheres, the luminaries being according to his teaching annular bodies; but from Aristotle onwards the Pythagorean

6 This was suggested by Diels, *Herodot und Hekataios*, Hermes, **22**, p. 414, n. 1, and is made so evident by a study of bibliographical data regarding ancient authors that it cannot reasonably be denied.

7 It was apparently the multiplicity of titles, assumed to imply an equal number of treatises, that led Zeller, *Phil. der Gr.* I^5, p. 197 n., to suspect that the bibliography of Suidas arose from a misunderstanding.

astronomy and cosmology so established itself that even the best writers spoke of 'spheres' where really 'circles' more accurately described the facts.[8] Hence it would be pressing too far a current expression to object to *Sphere* as a possible sub-title of the treatise *On Nature*. Of the *Tour of the Earth* we need for the movement to remark only that it is included in the list and refers beyond question to a geographical treatise, or in any case to a portion of a work, attributed to Anaximander, supposed to contain matters germane to geography. Whether other evidence of the existence of such a work in antiquity can be discovered elsewhere, we shall have presently to inquire.

Now this bibliographical index has been lightly, perhaps too lightly, set aside as valueless by modern scholars. Generally this is done without even a word of explanation; where anything is said, it is apt to be suggested that there is a mistake or that the titles were read out of references to the map and the celestial globe attributed to Anaximander.[9] As has been already stated, no exception is taken to the datum regarding the title *On Nature*, though it is now agreed to have been of later origin. To Zeller, apparently, it was the multiplicity of titles that occasioned surprise and doubt. Why it should do so, he did not indicate; but one may surmise that he had in mind the probability that Anaximander was the first prose writer and assumed that all beginnings are modest. We may later recur to the question whether Anaximander may with great probability be regarded as the originator of Greek prose; meanwhile it may suffice to say that this is not so certain as to justify *à priori* deductions from the hypothesis. To add to the difficulty, apparently, Suidas, after

8 This has led to grave misunderstandings, from Aristotle to our own day, even among the most critical historians of Greek thought.

9 For Zeller, see above, n. 7. Diels (V^3 I. 14, 23 note) suggests that the titles were concocted from such statements as that of Diogenes Laertius (ibid. l.9) καὶ γῆς καὶ θαλάσσης περίμετρον πρῶτος ἔγραψεν, ἀλλὰ καὶ σφαῖραν κατεσκεύασε, and from the fact that Anaximander first distinguished the 'sphere' (!) of the fixed stars. The use of κατεσκεύασε in regard to the 'sphere' shows that Suidas did not merely mistake the statement of Diogenes regarding the stars, as does the duplication Περὶ τῶν ἀπλανῶν καὶ Σφαῖραν. It is true that a confusion might have arisen in regard to ἔγραψε . . . Γῆς περίοδον, for it is conceded that γῆς περίοδος might mean a 'map,' and γράφειν with it might mean 'draw' as well as 'write'; but the entire list of Suidas is so patently bibliographical, and there is so little except *à priori* considerations to be urged against it, that one cannot take these suggestions seriously. Of Περὶ τῶν ἀπλανῶν and Σφαῖρα we have already said that on such a view the duplication is difficult to explain; even more so is καὶ ἄλλα τινά, which is hardly due to Suidas or his immediate source (Hesychius?), implying as it does the existence of other titles, as indeed we hear of one more from another source.

enumerating the four titles already considered, adds that Anaximander wrote 'some other treatises' not specified by name. Now we shall subsequently find another title, not included in the list of Suidas, which may with probability be referred to our Anaximander.

This circumstance might be considered as aggravating the difficulty to the point of rendering what was before an improbability a sheer impossibility. But this also does not necessarily follow; for it may be that we shall have to revise our notions concerning Anaximander and what is possible or probable in regard to him. It so happens that the title elsewhere cited and not specifically mentioned in the list of Suidas is identical with a title cited in reference to Hecataeus of Miletus. Now Hecataeus, as we shall presently see, was only a trifle over a generation younger than his fellow townsman Anaximander, and pursued studies in good part at least identical with his, taking up and perfecting his map and writing a geographical treatise which enjoyed a great and well deserved reputation. If it should prove that Anaximander was in intention primarily a geographer, the work of these two eminent Milesians would in fact lie quite in the same plane and run in part parallel, though each extended his line in one direction beyond the other's. Of this we shall have to speak more at length presently: what for the moment concerns us is to point out the fact that there is a striking similarity between these almost contemporary authors in regard to the titles ascribed to them. Hecataeus seems to have written one work, or at most two, but the recorded titles are quite numerous.[10] That these bibliographical data derived in part from the catalogues of the Alexandrian libraries admits of no doubt, and is in fact not questioned. Why we should not assume the same source for the bibliography of Anaximander does not appear. We have, therefore, thus far found no good reason for rejecting the testimony of Suidas, subject of course to the limitations which apply to all early titles, including that *On Nature*. The only apparently good reason will be presently found on closer examination to confirm the record that Anaximander wrote a geographical treatise.

We have seen that Suidas attributes the introduction of the gnomon or sun-dial to Anaximander. Diogenes Laertius reports[11] that "he first invented the gnomon and, according to the *Miscellany* of Favori-

10 See Jacoby, 'Hekataios' in Pauly-Wissowa's *Real-Encyc.*, **7** (hereafter abbreviated Jacoby), col. 2671 sq. This elaborate essay is at present by far the best study of Hecataeus, and must be read in connection with the same scholar's essay on Herodotus in the same work.

11 *V*[3] I. 14, 7.

nus, set up at Sparta, in the place called the Dial, one that showed the solstices and equinoxes, and contrived a sun-dial to tell the hours. And he first drew an outline of land and sea, and moreover constructed a (celestial) sphere." Critics have taken exception to certain details of this statement. While Suidas, Diogenes Laertius, and Eusebius[12] agree in attributing the invention of the sun-dial to Anaximander, the Greeks, according to Herodotus,[13] learned the use of the dial and the twelve-fold division of the day from the Babylonians. In view of what we said above regarding the ancient reports of inventions we may well concede that Anaximander did not invent, but merely introduced the instrument. Perhaps even the mere introduction was not due to him; for it is quite possible that dials had been brought to Ionia either from Babylon or from Egypt before his time. We have, however, no reason to doubt that Anaximander was one of the earliest known Greeks to make a scientific use of the instrument.[14] The dial which, according to Favorinus, he set up at Sparta, showed the equinoxes and solstices, and, according to Pliny,[15] Anaximander discovered the obliquity of the zodiac, which, together with the beginnings of the seasons as marked by the rising and setting of certain constellations, could be, and at least in later times were actually, marked on the dial, as connected with seasonal changes in the position of the sun. Such observations are manifestly related to astronomy, with which Anaximander is acknowledged to have greatly concerned himself. The heliacal setting of the Pleiades, long before observed, could with the aid of the dial be definitely dated with reference to the autumnal equinox.[16] But there is evidence that the risings and settings of the sun at the solstices and equinoxes were in early times used for geographical as well as for astronomical purposes. It is significant that there is no certain reference to the height of the sun at midday until the discovery was made in the time of Eratosthenes that the sun at the summer solstice was vertical over Syene.[17]

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12 *V*³ I. 14, 28. 13 Hdt. 2. 109.

14 There are grounds for attributing the use of the gnomon to Thales; but they are doubtful, and may here be disregarded.

15 *V*³ I. 15, 1. 16 *V*³ I. 19, 17.

17 Hdt. 2.25 is no evidence to the contrary. Eudoxus of Cnidus and (probably) Dicaearchus attempted to reckon latitudes, but the former at least seems to have limited his observations to the star Canopus. The alleged observations of Pytheas were questioned in antiquity and are even now in dispute. Observations of the sun were probably made earlier than Eratosthenes, but must have been very uncertain, as the calculations of the circumference of the earth and the determinations of latitude show. Even later the positions of the sun at rising and setting were observed along with its meridian height, as is proved by Strabo 2.5 (C 109) δύσεις καὶ ἀνατολὰς καὶ

By that time the mathematical theory of the globe-earth was fully worked out [18] and the value of the observation could be seen and the necessary conclusions drawn from it, which resulted in the geographical location of the tropics and the equator. But long before that we learn of the use of three equatorials, the central one passing through the straits of Gibraltar and defined with reference to the equinoxial rising and setting of the sun, and two other lines related respectively to the summer and to the winter sunrise and sunset, the former running from the Pyrenees to the Caucasus along the course of the Ister, the latter running parallel along the line supposed to be described by the upper course of the Nile from the Atlas Mountains to the upper Cataracts.[19] This scheme, known from Herodotus, is obviously a geographical projection of the lines of a flat disk sun-dial, which originally concerned itself with the positions of the sun, not at the meridian, but at the rising and setting, where its variations were far more conspicuous. Since this geographical scheme is unquestionably derived from the early Ionians, we naturally think of it as going back either to Hecataeus or to Anaximander; and of the two Anaximander surely has the better claim to it.

But it has been said that the sun-dial at Sparta cannot be attributed to Anaximander, since Pliny [20] says that it was Anaximenes, the disciple of Anaximander, who set it up. It is surprising that this objection should have been seriously considered; for in the same breath Pliny attributes the invention of the science of the gnomon to Anaximenes. The latter statement no one accepts, and with good reason; for Anaximenes is in comparison with Anaximander a figure of hardly secondary importance. The natural inference is that in this case Pliny misunderstood a statement in his source, which may well have been superficially ambiguous, since the clause regarding the discovery of the science of the gnomon and the erection of a dial at Sparta, might well have been introduced by a demonstrative susceptible of reference either to Anaximander or to Anaximenes, both of whom were mentioned. In this connection it is well to remark that while there is nothing else in the literary tradition associating

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μεσουρανήσεις. This can hardly be explained except as a survival from earlier practice. Traditionally μεσημβρία merely meant 'noonday' or 'south,' as was natural to any people living north of the tropic of Cancer.

18 As is clear from Aristotle.

19 See, *e. g.*, Ephorus *fr.* 38 (Müller *Hist. Gr. Frag.* I, 243). I hope to discuss this more fully on another occasion. I do not, of course, refer to the alleged 'zones,' of Parmenides: they are either a gross misinterpretation of something quite different or a pure invention of later writers.

20 *V*[3] I. 24, 40.

Anaximenes with Sparta, it is reported [21] that Anaximander warned the Spartans to abandon their city and houses and live in the open because he anticipated the earthquake which destroyed the entire city. We cannot, unfortunately, rely implicitly on these statements; but if they were true we should have the more reason to suspect that the bronze map of the earth which Aristagoras of Miletus brought to Sparta [22] in his effort to persuade that State to aid the Ionians in overthrowing the Persian power was in fact the map of Anaximander who was commended to the Spartans by personal relations. [23] But whether this map was that made by Anaximander or, as some prefer to think, the revised and perfected map of Hecataeus, who was conspicuously prominent in the Ionian revolt, makes very little difference for our purposes. The presence of a sun-dial at Sparta is as intelligible as that of the map; for both were related to geography, and Anaximander no less than Hecataeus was a geographer. Nor should it cause surprise that Anaximander should thus be supposed to have visited Sparta. It is true that we have no other record of his travels, but in view of the scantiness of the reports regarding him, this is not significant. One can hardly think of a geographer, especially of a pioneer in the field, as confining his studies to his native city and to such information as he could there obtain at second hand. His successor Hecataeus, we are told, had travelled widely.

Of the 'sphere' which Anaximander is said to have constructed we cannot say much. Its relation to his astronomical or cosmological studies is sufficiently obvious. It was as natural that he should attempt a graphic or plastic representation of the heavens as of the earth. Whatever its form, it would serve to visualize the obliquity of the zodiac, which he discovered, and to relate the constellations, in their risings and settings, to the seasons and the changing position of the sun. Anaximander presumably never realized how much this attempt was destined to contribute to the final overthrow of his conception of a disk earth and to the eventual revision of his map; for, once the heavens came to be clearly visualized as a sphere, the advance of geometry, which he is said to have cultivated, and the

21 V^3 I. 15, 5. 22 Hdt. 5.49.

23 It is quite possible that Anaximander may have been sent by Croesus as one of his ambassadors to Sparta when he sought an alliance with the leading power in Greece (Hdt. 1.69); though the Lydians were by this time pretty well Hellenized, diplomacy would suggest that on such an errand he should send Greeks, and none would have been more suitable, it would seem, than a man of prominence among the Milesians, his subject allies. At any rate, Lydia and Miletus clearly had relations with Sparta at that time which would readily account for Anaximander going there.

detailed observation of the stars, to which his sun-dial and 'sphere' must have added impetus, led inevitably to the postulate of a spheroidal earth. This postulate, as is well known, came not from geography, but from the study of the heavens. Indeed, long after the newer conception of the earth had sprung from the speculations of the Pythagoreans, who were geometers and not at all practical geographers, the maps of the geographers, though gradually modified, preserved the impress of their Ionian originators and of their conception of the disk earth.

As to Anaximander's map, we do not know through what intermediaries the notice regarding it came to the handbook of Diogenes Laertius. His testimony does not, however, stand alone, but is supported by the geographical tradition. The filiation in detail of the works on geography in which his map is mentioned need not detain us here. Leaving aside several unimportant notices [24] which add nothing to our enlightenment, we may confine ourselves to the statements of Agathemerus and Strabo. The former says [25] "Anaximander of Miletus, who 'heard' Thales, first had the hardihood to depict the inhabited earth on a tablet. After him Hecataeus of Miletus, a man who had travelled widely, refined his work to the point of admiration. Hellanicus of Lesbos, indeed, a man of wide learning, handed down the fruits of his research unaccompanied with a formal representation. [26] Then Damastes of Sige, borrowing chiefly from the works of Hecataeus, wrote a geographical work; in due order Democritus and Ephorus and certain others composed systematic *Tours of the Earth* and *Geographies*." Of this statement it need only be said that it contains a selected list of geographers, whether they prepared maps or not, extending roughly down to the time of Eratosthenes. The list is carelessly drawn and the phrasing is at more than one point ambiguous; but the difficulties which it presents do not specially concern us here.

To Strabo we are indebted for two passages relating to Anaximander as a geographer. Beginning his geographical treatise he says, "Geography, which I have now chosen to consider, I hold as much the pursuit of the philosopher as any other science. That my opinion is sound is clear from many considerations. For not only were the

24 Eustathius, *Comm. in Dionys.* (Müller, *Geogr. Gr. Minor.* II. 208, 14) and *Schol. in Dionys.* (*ibid.* II. 428, 7).

25 V^3 I. 15, 9 quotes the first sentence only. For full text see Müller, *o.c.* II. 471.

26 This is the accepted meaning of the phrase ἁπλάστως παρέδωκε τὴν ἱστορίαν, but it is not certain: it is possibly a criticism of the literary style of Hellanicus.

first who boldly essayed the subject men of this sort,— Homer, and Anaximander, and Hecataeus, (as Eratosthenes also says) his townsman, and Democritus also and Eudoxus and Dicaearchus and Ephorus and others more; and besides, after their time, Eratosthenes and Polybius and Posidonius, philosophers all. But, what is more, wide and varied learning, by which alone it is possible to achieve this task, belongs peculiarly to the man who contemplates all things divine and human, the science of which we call philosophy." Here Anaximander is presented as a geographer who, like numerous other worthies, including Homer, is regarded as a philosopher. The two-fold fact that Eratosthenes is cited as authority for the citizenship of Hecataeus and that the list of worthies falls into two groups of which Eratosthenes heads the second, suggests that that eminent geographer had something to do with drawing up the roll of geographers. His contribution does not, of course, extend beyond the first division; and even there we must except Homer, whom Eratosthenes declined to recognize either as a philosopher or as a geographer, insisting that he was to be regarded solely as a poet bent on entertaining his readers. [27] Nor can we credit Eratosthenes with rating the others as philosophers; for, aside from the vague conception of what constitutes a philosopher, which is characteristic of Strabo's cast of thought, [28] it is to be noted that Hecataeus, for reasons which will engage our attention later on, was never seriously regarded as a philosopher and hence does not figure in the doxographic tradition. [29] The same is true of Ephorus. [30]

The reference of Strabo, however, to the 'wide and varied learning' (polymathy) required of the geographer recalls that Heraclitus rebuked

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27 See Strabo I. 2, 3 C.15. It is probable that Strabo in his judgment of Homer was merely echoing Ephorus.

28 If Ephorus was his model, we might think of Isocrates and his conception of philosophy. Strabo however was a Stoic; and in late Stoics a similar conception of philosophy may be found.

29 In *Dox. Gr.*, p. 681 Diels referred Aetius II. 20, 16 to him, but has since corrected the error and assigns the notion to Hecataeus of Abdera (*V*[3] II. 153, 3).

30 Aetius IV. 1, 6 is only an apparent exception. It refers to the inundation of the Nile and probably comes from the 'Posidonian Areskonta.' The theme properly belongs to geography and was a favorite subject of speculation. Diodorus Sic.1. 37, 1 says *μεγάλης δ'οὔσης ἀπορίας περὶ τῆς τοῦ ποταμοῦ πληρώσεως, ἐπικεχειρήκασι πολλοὶ τῶν τε φιλοσόφων καὶ τῶν ἱστορικῶν ἀποδοῦναι τὰς ταύτης αἰτίας.* That Herodotus (Aetius IV. 1, 5) appears in the list along with Thales, Euthymenes, Democritus, Ephorus and Eudoxus, is sufficiently significant. All but Thales (and he is not certainly an exception) were geographers. Anaxagoras likewise is included in the list, but possibly by confusion; for the explanation attributed to him is older than he, as is plain from Aeschylus *fr.* 300. Possibly Anaximander may have been the originator of the theory that the flood of the Nile was due to the melting of snows in Ethiopia.

it, saying[31] "Polymathy does not teach one to have understanding, else would it have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus." It was apparently the historical and geographical interest[32] of these men that invited the rebuke of the Ephesian recluse. Such breadth of interest was of course characteristic of the whole line of historians and geographers. Pythagoras alone seems strange in such company. Why he should have been decried as a polymath is not clear;[33] but we must recall that he came from Samos, where he may well have imbibed some of the varied knowledge of the Milesian circle, and that we have no authentic account of the range of his interests. What is commonly attributed to him is for the most part true of his school only. He may have been interested in geography, but neither the nature of the reports to that effect nor the record of his school would warrant one in affirming that he was. Heraclitus is said[34] to have referred to Thales' prediction of the eclipse: in what terms he may have done so, we do not know. There is nothing to show what he may have thought of Anaximander.

But to return to Strabo. A few pages after the passage above quoted he resumes:[35] "Let this suffice to justify the statement that Homer was the first geographer; but those also who succeeded him are known as noteworthy men and of the kindred of philosophy; the first of whom after Homer, Eratosthenes says, were two, Anaximander, an acquaintance and fellow citizen of Thales, and Hecataeus the Milesian; the one, he says, first gave out a geographical tablet (map), the other, Hecataeus, left a treatise attested as his by his other writing."[35a] The importance of this statement, coming from Eratosthenes the renowned geographer and chronologist, who served as head of the great library at Alexandria, is at once apparent. Just what it

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31 *Fr.* 49 Diels.

32 Cp. Philo. Jud. *De congressu eruditionis gratia*, 15, p. 521 M. γραμματικὴ μὲν γὰρ ἱστορίαν τὴν παρὰ ποιηταῖς καὶ συγγραφεῦσιν ἀναδιδάξασα πολυμάθειαν ἐργάζεται. For Xenophanes one may cite (quite apart from his supposed poem Περὶ φύσεως) his observations of natural phenomena in various places, his obvious interest in ethnology, and his poems regarding the founding of Colophon and Elea. Why one should doubt the report that he wrote these poems does not appear. Hecataeus (fr. 352) refers to the colonization of Sinope.

33 One might think of his 'borrowing' his 'symbols' from Egypt, if Heraclitus was of the opinion of Herodotus; but Heraclitus himself may be charged with borrowing from Egypt, or at least with utilizing notions which the Ionians thought to discover in Egypt.

34 *Fr.* 38 Diels.

35 I. 1, 11 C. 7.

35a For the use of γραφῇ here cf. Dionys. Hal. *De Thucyd.* 1 ἐδήλωσα καὶ περὶ Θουκυδίδου τὰ δοκοῦντά μοι, συντόμῳ τε καὶ κεφαλαιώδει γραφῇ περιλαβών.

signifies is perhaps not quite so clear. Let us consider it somewhat more at length.

This passage bears out the conclusion we reached above in regard to the list of geographers drawn up by Eratosthenes. It was not for their supposed connection with philosophy, but solely as geographers that he mentioned Anaximander and Hecataeus, and Homer was not entered in the roll of honor. As regards the contribution of these pioneers of the science it hardly needs to be said that the testimony of so great an authority as Eratosthenes to the fact of Anaximander drawing a map has been accepted as conclusive evidence by all modern scholars. This conclusion is justified, however, not because Eratosthenes made no mistakes in regard to the authenticity of works, but rather by the circumstances, (1) that we cannot in this instance go farther and check his conclusion by better evidence from other sources, and (2) that in this case his decision is positive and not negative. The first of these principles must always hold in historical inquiries when there is no sufficient reason for impugning the testimony of a generally trustworthy and competent witness. The second is of importance in relation to the judgments of the Alexandrian librarians, because they assumed a critical attitude and erred in general, when they erred, in refusing to admit rather than in affirming the genuineness of works entered in their catalogues. For us, therefore, there remains no alternative but to accept the map as an historical fact.

But what of the geographical treatise attributed to Anaximander? It will perhaps be urged that the statement of Eratosthenes reproduced by Strabo confirms the judgment of those who would reject the report of Suidas, to the effect that Anaximander wrote a *Tour of the Earth*. If this be true, we are on dangerous ground when we refer the list of his works preserved by Suidas to the catalogues of the Alexandrian libraries. But what is affirmed, and what is implied, in the statement of Eratosthenes? The genuineness of Anaximander's map and of Hecataeus' geographical treatise is unquestionably affirmed. One may, if one will, insist that the word 'first' be taken with both statements, so that Eratosthenes shall be made to affirm not only that Anaximander first gave out a map but that Hecataeus first left a geographical treatise. Though possible, the construction is extremely improbable and forced. Yet, even if so much were granted, what is implied in the sentence as a whole? It is not stated that a geographical treatise attributed to Anaximander did not exist or had not existed; rather the affirmation that the claims of such a treatise, attributed to Hecataeus, to be regarded as genuine were confirmed by

his other writing, when considered in relation to the sentence as a whole, would seem to imply that Eratosthenes had knowledge of a treatise attributed to Anaximander, which, however, was not so or otherwise sufficiently authenticated.[36] If this exegesis be sound, and I believe it is, we discover in the very text which, superficially viewed, seems to discredit the bibliography of Suidas, a confirmation of our thesis that the geographical treatise of Anaximander was entered in the Alexandrian catalogues. We may, however, infer from the statement of Eratosthenes that in his time, at least, it was noted as subject to question.[37]

We must now inquire how much weight we should assign to the doubt of Eratosthenes regarding the genuineness of the work attributed to Anaximander. At first sight it would appear that he was as competent a judge in such matters as one could readily find; for one recalls that he was alike eminent as a geographer and as a student of chronology, the former interest seeming to qualify him in a special way to speak with authority on matters connected with the history of geography and in particular with geographical literature, the latter bespeaking for him uncommon credit in regard to the moot questions concerning 'inventions.' But upon closer examination one discovers that these pretensions vanish in thin air. Eratosthenes was, indeed, a geographer and a chronologist of deservedly high repute; but in both fields it was not the antiquarian details, but the scientific principles involved, that chiefly engaged his attention and owed to his efforts a noteworthy contribution. It might well happen, in consequence, that he should err in judgment in regard to matters which lay outside his proper field of study and less invited his interest. We should not be surprised, therefore, if others more directly interested and in such matters more competent should prove to have abandoned his doubts regarding the geographical treatise of Anaximander. That such was in fact the case we shall now try to show with such degree of certainty

36 *Per contra*, the existence of a map drawn by Hecataeus is not denied, though it likewise is not affirmed. The geographical treatise of Anaximander and the map of Hecataeus are on the same footing, except in so far as the authenticity of the treatise of Hecataeus, as confirmed by his other writing, suggests a want of such authentication for the treatise of his predecessor. It is sometimes said that the remark about Hellanicus implies that Hecataeus made a chart; but that remark, as was pointed out above (n. 26), is by no means unambiguous.

37 One may apply to Eratosthenes what Jacoby (col. 2673) has said of Callimachus in regard to the geographical treatise of Hecataeus, to wit, that it is not probable that he had gone carefully into the question of the authenticity of the document. There being for some reason occasion for doubt or question, it was prudent not to affirm it.

as is possible in such matters. As is generally the case in historical questions where a conclusive text is not to be produced, the evidence in this instance must be cumulative and must be presented piecemeal with a running commentary. The judicial reader will follow and weigh the arguments in detail, suspending sentence until the whole case has been presented.

We may sum up the conclusions which we have thus far reached in the following propositions. (a) Anaximander wrote a treatise, current in antiquity and accepted as genuine, which was commonly entitled *On Nature*. (b) There were recorded in the catalogues of the Alexandrian libraries certain other titles purporting to belong to him, such as *Tour of the Earth, On the Fixed Stars, Sphere,* and others not specified. (c) These titles were one and all of later origin, and, being quite possibly at least in part subtitles, indicate at most the scope of his writing without in any way revealing his predominant interest or creating a reasonable presumption in regard to the number of treatises, one or more, which he may be thought to have written. (d) He was credited with the invention or introduction of the sun-dial, which he employed for scientific purposes, certainly as regards cosmology or astronomy, probably in the interest of geography. (e) He drew a map of the earth, which was believed to be the first of its kind and to entitle him to be considered the first scientific geographer. (f) He is credibly reported to have constructed a 'sphere' or representation of the heavens. (g) Eratosthenes had knowledge of a geographical treatise attributed to Anaximander, which he did not consider sufficiently authenticated to justify him in crediting the father of scientific geography with more than the drawing of a map.

So far, then, as the geographical treatise is concerned, down to the time of Eratosthenes the verdict must be *non liquet*, though the admitted interest of Anaximander in the science of geography may be said to favor the presumption that he did not in his book, the existence of which is acknowledged, forego treating a subject so certainly in his thoughts. But Eratosthenes does not mark the close of scientific and antiquarian studies at the Alexandrian libraries in the fields of geography and chronology. The later advances in the science of geography do not concern us here; but it is necessary to direct attention to another scholar whose chosen pursuits especially qualified him to carry forward and revise in detail the historical studies of Eratosthenes. Apollodorus of Athens, the most illustrious disciple of the great Alexandrian critic Aristarchus, devoted himself with zeal and learning especially to the antiquarian aspects of geography and chro-

nology. Attentively reading a vast number of books he published the results of his historical studies chiefly in two works,—his versified *Chronicles*, in which the dates of writers were as precisely as possible fixed, and *The Catalogue of Ships*, in which he gathered about the Homeric *Catalogue* the fruits of his researches in geography. Connected with this learned commentary was his work *On the Earth*, like the *Chronicles*, versified. He wrote, besides, on mythology, prompted by an interest in literary history. Apollodorus is, therefore, of all ancient critics the one whose testimony regarding the book of Anaximander we should most wish to learn.

By a singular good fortune we are in fact in a position to ascertain at least in part what Apollodorus knew of Anaximander's writings. Diogenes Laertius says[38] that Anaximander "gave a summary exposition of his opinions, on which Apollodorus of Athens somewhere chanced, who in his *Chronicles* reports that he was sixty-four years of age in the second year of the fifty-eighth Olympiad and died shortly thereafter." In the light of our foregoing discussion, this most interesting statement deserves somewhat fuller consideration than it has hitherto received.

Whence Diogenes derived this datum is not certain; but one may conjecture from the phraseology that it came mediately or immediately from the late doxographic document which Diels has called the Posidonian Areskonta. It is known that Posidonius followed closely in the footsteps of Apollodorus, whose geographical studies he took up and prosecuted to the best of his ability. But in any case Apollodorus made the statement in question in his *Chronicles*. By 'opinions' Diogenes of course means 'philosophical' opinions, and therefore, though Apollodorus does not seem to have cited the title of the 'summary exposition,' it is commonly assumed that it was the treatise appropriately called *On Nature* to which he referred. Diels has cited[39] as a parallel the chronological datum given by Democritus in his *Brief Cosmology*, and suggests[40] that the year designated was that of the publication of the treatise, which contained autobiographical references capable of astronomical determination. This is of course conceivable; but, it must be pointed out, this hypothesis, while possibly accounting for the given year, fails to explain

38 *V*[3] I. 14, 11.

39 *Chronologische Untersuchungen über Apollodors Chronika*, Rhein. Museum, N. F. XXI, p. 24. Cf. Jacoby, *Apollodors Chronik*, p. 53 sq.

40 *V*[3] I. 14, 13 (note). It is worth mentioning that we have no record of any remarkable astronomical phenomenon in that year.

the further statement of Apollodorus that Anaximander died shortly afterwards. If, as we are bound to do, we confine ourselves to such information as Apollodorus might derive from the book he had met with, without assuming either data from other sources or unwarranted inferences on the part of the chronologist, we must frame a better theory. Such an hypothesis is in fact not far to seek, and has indeed been already in part suggested by Professor Burnet. [41]

Diogenes dates Anaximander by the second year of the fifty-eighth Olympiad. This statement does not derive directly from Apollodorus, who used the year of the Athenian Archon Eponymus instead of the Olympiad. But the chronological practice of Apollodorus suggests not only that the datum really comes from his work but also that it was based upon information of a peculiarly definite sort. Ordinarily Apollodorus contented himself (perforce, no doubt) with determining the *floruit* of a man, taken as forty years of age, with reference to some epoch or the beginning of a king's reign, if a relation could be established. One sees at once the exceptional character of the datum regarding Anaximander; for the age is not forty, but sixty-four, and the year (B.C. 547/6) is not one of his regular epochs. The following year, however (546/5), is one of the important epochs of Apollodorus, being that of the fall of Sardis. The preceding year, moreover, though not marking an epoch for Apollodorus, was one of fateful consequences to the Ionians of Miletus, among whom Anaximander was a man of great prominence; for the march of the Persians under Cyrus against Croesus, whose subject allies the Milesians were, and the defeat of Croesus at the Halys, must have filled Anaximander with dismay. Nothing would be more natural than for him to mention these events,[42] if he dealt at all with geographical or historical matters; for they were obviously of great potential significance from either point of view. If he was personally active in this campaign, as he may well have been, he might properly give his age. Thus we should have a reasonable hypothesis to account for the report

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41 *Early Greek Philosophy*[3], p. 51. He refers to the circumstance that the date in question is the year before the fall of Sardis, and to the question (which, to judge by Xenophanes, *fr.* 22, was considered interesting in those days), 'How old were you when the Mede appeared?' *Ibid*, n. 3 Burnet adds, "The statement that he 'died soon after' seems to mean that Apollodorus made him die in the year of Sardeis (546/5), one of his regular epochs."

42 It is by no means certain that 'the common report of the Greeks' (rejected by Hdt. 1.75) that Thales served Croesus as engineer on this occasion, turning the Halys River, was false. If Thales was in the army of Croesus, Anaximander his 'comrade and kinsman' quite probably also was there: sufficient reason, in either case, for mentioning the event.

of Apollodorus regarding his age in this precise year. The additional statement that he died not long thereafter would be adequately explained if Anaximander's book made no mention of the fall of Sardis, which soon followed.

It will be seen that this hypothesis carries us beyond the natural scope of a cosmological treatise, such as would necessarily be entitled *On Nature*, into a field more closely connected with history or geography. It may be said, however, that, while this assumption would meet the necessary conditions, others equally as good might be made to fit the requirements. Granted that an hypothesis, however satisfactory, is not to be accepted as proof, we are justified in saying that this particular hypothesis has more probability in its favor than any other that has been proposed, and is at least in a measure supported by the evidence of Anaximander's interest in geography.

But we have not yet exhausted the possible sources of information regarding Anaximander's book. Aside from a fragment preserved by Simplicius, to which we shall later return, there are mentioned certain opinions and passages attributed in our sources to 'Anaximander.' Their status, however, is uncertain, because we hear of another Anaximander of Miletus, to whom they have generally been referred. We are bound, therefore, to consider the new claimant and the validity of his claims.

What we may be said to know about the other Anaximander is little enough, being contained in two brief notices. Diogenes Laertius reports[43] that "there was also another Anaximander, an historian, he too being a Milesian, who wrote in Ionic." The entry of Suidas regarding him runs thus: "Anaximander the Younger, son of Anaximander, of Miletus — historian. He lived in the time of Artaxerxes Mnemon; wrote *Interpretation of Pythagorean Symbols*, e.g. 'not to step over a cross-bar,' 'not to poke the fire with a poniard,' 'not to eat from a whole loaf,' and the rest." The first gives nothing omitted in the second notice except that he wrote in Ionic, which was natural if he wrote before Attic became the recognized medium for prose, as it did in the fourth century B.C. As Artaxerxes Mnemon reigned 405–359 B.C., and the chronological datum 'he lived in the time of such and such a king' regularly refers to the date of the king's accession (405), this information was not material. Suidas, then, alone gives us significant data. We gather, then, that Anaximander was a fairly frequent name at Miletus, as this notice acquaints us with

43 V^3 I. 14, 18.

two, father and son. If they were not related to the great Anaximander, his fame may account for the perpetuation of the name in his city. Anaximander the Younger is called an historian, which might be significant if we were not immediately informed what sort of history he wrote without getting the least intimation that he produced anything beyond the *Interpretation of Pythagorean Symbols*. Though Suidas gives us no specimen of his interpretations and we have no evidence in regard to them from other sources, we fortunately are not without instructive examples of the same literary kind from other hands.[44] At their best they are reports of an antiquarian character regarding curious practices in Greece or foreign lands; at their worst they are stupid attempts at symbolical interpretation. They cannot predispose us to think of Anaximander the Younger as a serious rival of his great eponym; and in any case the fact that he is called an historian, with such a work and such only to his credit, offers no justification for assigning to him every fragment or notice which would be appropriate to an historian.

Having seen what manner of man Anaximander the Younger was according to the only certain information we have regarding him, we must now canvass the data which Greek tradition attributes simply to 'Anaximander' and modern scholars commonly credit to the account of the author of the *Interpretation of Pythagorean Symbols*. A scholium on Dionysius Thrax[45] reports, "Ephorus among others in his second book says that Cadmus was the inventor of the alphabet; others say that he was not the inventor but the transmitter to us of the invention of the Phoenicians, as Herodotus also in his *History* and Aristotle report, for they say that Phoenicians invented the alphabet and Cadmus brought it to Greece. Pythodorus, however, in his treatise *On the Alphabet* and Phillis of Delos, in his treatise *On Chronology*, say that before the time of Cadmus Danaus imported it; and they are confirmed by the Milesian writers Anaximander and Dionysius and Hecataeus, who are cited in this connection by Apollodorus also in his treatise *On the Catalogue of Ships*." The word vaguely rendered 'writers' in the foregoing version should probably be translated 'historians,' its usual meaning in later Greek. Possibly it was this consideration that prevailed with modern scholars, leading them

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44 See V^3 I. 357, 13 sq. When one considers Heraclitus *fr.* 129 Diels and Hdt. 2.49, 2.81, Plut. *Qu. Conviv.* 728, 729A, where Hdt. 2.37 is quoted, one understands the reason for studying the derivation of the Pythagorean symbols.

45 P. 183. 1 Hilgard.

to assign this datum to Anaximander the Younger. Diels alone, apparently, has latterly had misgivings; for after ignoring this passage in the first two editions of his invaluable *Vorsokratiker* he included it in the third, but marked it as dubious under the heading of the elder Anaximander.[46]

Intrinsically there can be no valid objection to the assumption that the early Milesians Anaximander, Dionysius and Hecataeus concerned themselves with the question regarding the source of the Greek alphabet. The absurd notions regarding the late beginnings of literature in Greece, based on a few ignorant utterances of late Greeks and fostered by the incomprehensible influence of Wolf's *Prolegomena* might account for the hesitation of some modern scholars to credit such a report, which obviously implies that to the Ionians of the time of Pisistratus writing was so familiar a fact that they must seek its origins in the distant mythical past; but, apart from such preconceptions, there is no ground for calling it in question. It is rather just what the intelligent student should have expected, not only from a reading of the Homeric poems, whose literary perfection and contents are incomprehensible except on the supposition of long literary practice, but also from a critical reading of the extant remains of early Greek historical writings. Herodotus, whose dependence on early Ionian, especially Milesian, writers is unquestionable, has no doubt of the derivation of all higher elements of Greek civilization from Egypt, and constantly presupposes two lines of transmission, one direct, mediated by Danaus, from Egypt to Argos, the other indirect, in which the Phoenicians play the rôle of intermediaries.[47] In the latter line Cadmus, who is supposed to have come from Tyre to Thebes, is not the only link. It is not necessary here to go into details. Suffice it to say that on the ground of intrinsic probability no objection can be urged against the assumption that Anaximander, the contemporary of Croesus, held the opinion that Danaus brought the alphabet direct from Egypt.

Nor can there be a reasonable doubt that the elder, and not the younger, Anaximander is intended. The datum furnished by the scholiast is referred to Apollodorus of Athens, who had cited 'the Milesian historians Anaximander, Dionysius and Hecataeus' for the opinion in question, in his great historico-geographical treatise *On*

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46 V^3 I. 21, 24.

47 See Hdt. 5. 58; 2. 37, 44, 49, 54, 79. For the views of Hecataeus in regard to the derivation of Greek civilization from the Orient, see Jacoby, col. 2678, 2697, 2741.

the Catalogue of Ships. He it was, we recall, who somewhere met with Anaximander's book, from which he must have derived the information enabling him to date the old Milesian with such singular precision. The character of that information, as we have pointed out, was presumably historical and geographical. The datum regarding the origin of the Greek alphabet, being of the same character, naturally found its way into a work belonging to the same line of tradition. But the date of Anaximander was, as we have seen, properly given in Apollodorus' *Chronicles*. Since he was especially interested in chronology, we should expect Apollodorus to give the names in chronological order.[48] In the versified *Chronicles* he might for metrical reasons depart from this natural order, but not in his prose treatise *On the Catalogue of Ships*. He observed, therefore, the order — right or wrong — in which these writers appeared in his *Chronicles*, barring metrical difficulties not likely to occur except in the event that they had to be mentioned in the same clause.

Now it happens that the names Anaximander, Dionysius, Hecataeus actually follow one another in alphabetical order. In the case of Anaximander, acknowledged to be older than the other members of the group, nobody would deny that chronological considerations might nevertheless have determined his position at the head of the list; but in regard to the other two question will at once arise, because Dionysius is commonly considered junior to Hecataeus. We have then to canvass the question of their chronology, especially in so far as Apollodorus may be supposed to have been concerned in fixing it. The datum unquestionably from his treatise *On the Catalogue of Ships* we have seen, as well as the reasons for regarding his list as arranged in chronological order. Aside from this we have several other statements. Heraclitus, as we have observed, names his polymaths in the following sequence: Hesiod, Pythagoras, Xenophanes, Hecataeus. That this order is roughly chronological will not be denied, though a question might arise regarding the relative ages of Pythagoras and Xenophanes. They were in any case roughly contemporary, and Xenophanes referred to Pythagoras.[49] Hence we may disregard this

48 In careful prose writers this was the common practice; cf. Hecataeus *fr.* 143 and 365; but it was of course not invariable. Sometimes, as *e.g.* in scholia carelessly composed or resulting from the abbreviation of longer discussions, the rule is not observed, cf. Hecataeus *fr.* 334. In the case of Apollodorus it is almost a foregone conclusion that he followed this practice, natural to one who was so deeply interested in determining the chronology of authors.

49 *Fr.* 7 Diels. This does not, of course, prove that Pythagoras was the older; but it might be so taken by Heraclitus.

nice question of chronology, which cannot be settled. Hecataeus, at all events, was younger than both and earlier than Heraclitus. We have, moreover, the evidence of Herodotus,[50] who represents Hecataeus as prominent in the councils of Miletus in the Ionian Revolt (499 and 497/6). The rôle which he plays in these events proves that he was an 'elder statesman.' In the article of Suidas about Hellanicus there is clearly a confusion, which others have sought to correct.[51] In view of this corruption of the text, one cannot of course adduce it in evidence. Even worse is the entry of Suidas in regard to Dionysius. "Dionysius of Miletus, historian: *Events after Darius* in five books, *Geography*, *Persian History* in the Ionic dialect, *Trojan History* in three books, *Mythical History*, *Historic Cycle* in seven [52] books." Here, as all acknowledge, we have a hopeless jumble arising from the confusion of an indeterminate number of the almost innumerable writers who bore the name of Dionysius. This being so, we must clearly rule out this datum also as incapable of yielding a date; for the only item in this bibliographical farrago possibly serviceable for chronological purposes, the *Events after Darius*, not only shares the general doubt attaching to the list as a whole, but is in itself ambiguous.[53] That Dionysius of Miletus was an historian we must grant, and that he wrote on Persian history in the time of Cambyses and Darius I. is exceedingly probable.[54] Beyond that we have thus far been unable to go.

There is, however, another chronological datum to be found in the entry of Suidas regarding Hecataeus: "Hecataeus, son of Hegesimander, of Miletus; he lived in the time of Darius who was king after Cambyses, when Dionysius of Miletus also lived, in the sixty-fifth Olympiad: a writer of history." This chronological notice, obviously

50 Hdt. 5. 36, 125.

51 καὶ Ἑκαταίῳ τῷ Μιλησίῳ ἐπέβαλε γεγονότι κατὰ τὰ Περσικὰ καὶ μικρῷ πρός (πρόσθεν?). Here various scholars have proposed to read γεγονώς (for γεγονότι), referring the date to Hellanicus, who would thus be regarded as forty years of age ca.480 B.C., and consequently forty years younger than Hecataeus. That the text is corrupt is evident: the proposed emendation is doubtful.

52 Eudocia says '*six* books.'

53 Not to speak of 'Darius the Mede,' *i.e.* Astyages (according to Syncellus), there were three Persian kings of that name, between whom it is impossible to choose without knowing which Dionysius is supposed to have written the history.

54 Certain parts of the story of Cambyses as told by Herodotus, such as the embassy of the Ichthyophagi to 'the long-lived Ethiopians' (3.20 sq.), certainly are steeped in Milesian science and almost certainly come from a Milesian author; but there is nothing apparently to suggest Hecataeus. Here one might well conjecture that Herodotus was borrowing from Dionysius. Other similar matters occur in the third book of his *History*.

derived from some chronicle, was it would seem, somewhat awkwardly combined with a bibliography, which has in consequence been lost.[55] It admits of no doubt, however, that the chronologist was himself quite clear in regard to the Milesian writers and their date; and I do not entertain the least doubt that the chronological datum comes ultimately from Apollodorus. In form it agrees perfectly with numerous others derived from his *Chronicles:* it is obviously intended to fix the *floruit* of Hecataeus and Dionysius at the year 520 B.C., the year in which Darius, the last Persian king with whom the chronologist could establish a connection, became King of Babylon.[56] Apollodorus no doubt dated by the Athenian Archon Eponymus, but some later author converted the date, using the corresponding Olympiad. We thus see that Apollodorus might perfectly well name the two Milesian historians in either order, Dionysius and Hecataeus, or Hecataeus and Dionysius, since he fixed their *floruit* in the same year. The two statements therefore complement and confirm one another. Regarding Hecataeus, at any rate, the date, which would make him over sixty years of age at the time of the Ionian Revolt, cannot be far wrong: and respecting Dionysius we have no information that in the least justifies us in questioning the correctness of Apollodorus' calculation.

Having disposed of the objections to the acceptance of the statement attributed to Apollodorus and having justified our reference of it to the elder Anaximander, it remains for us to signalize the importance of the fact reported as evidence of the character and contents of his book. So much at least we may confidently affirm: that it did not confine itself to cosmological and other cognate matters which might justify the title *On Nature* to the exclusion of such a title as *Tour of the Earth;* for a glance at the list of authorities whom the scholiast on Dionysius Thrax cites in regard to the origin of the

55 The statement that Herodotus, his junior, profited by the work of Hecataeus, which here occurs, recurs elsewhere; when it is asserted that Hecataeus was a 'hearer' of Protagoras, there is obviously a confusion, most probably due to the dropping out of a sentence or two. Protagoras probably came into the passage as going with Herodotus to Thurii; beyond that one is at a loss for reasonable conjecture. The further statement of the entry regarding Hecataeus, that he was the first to publish a prose history, while Pherecydes published the first prose treatise, a farrago of literary odds and ends belonging to the class of εὑρήματα, shows the general character of the source from which Suidas derived this part of his notice. It somehow crowded out the data regarding Hecataeus' own book derived from the catalogues of the Alexandrian libraries. These we are able in a manner to recover from other sources.

56 This is precisely in the manner of Apollodorus. Why Jacoby should deny that this date comes from him I cannot comprehend.

Greek alphabet, as well as a consideration of the logical context of such an inquiry, must suggest that the book of Anaximander, like those of Hecataeus, Dionysius, and Herodotus, belonged at least in part to the historico-geographical line of tradition. Regarding Hecataeus and Dionysius there can be no question; but Anaximander also is classed with these admittedly 'historical' writers.

We may be pardoned for insisting that we are thus abundantly justified in holding fast our faith in the essential correctness of the bibliography of Anaximander preserved by Suidas and in the derivation of the list of titles from the catalogues of the Alexandrian libraries. It was there in all probability that Apollodorus found the book, which, as we have seen, was known by report, if not by sight, to Eratosthenes. It is possible, indeed, that Apollodorus discovered the book of Anaximander at Pergamum, where he was active in later life, and where his interest in antiquities must have made him welcome; but the book must have been rare in his day, and Alexandria is surely the place where we should most expect to find it. If we assume that the book was there in the time of Eratosthenes we shall not violate probabilities; for the case, far from being unexampled, would find a close parallel in the same field. We know from Athenaeus [57] that Callimachus, presumably in his catalogue, attributed either the *Tour of Asia*, or, more probably, the entire *Tour of the Earth* of Hecataeus, of which the *Tour of Asia* was a part, to one Nesiotes, though we do not know on what grounds.[58] Conjecture is easy but profitless. But Eratosthenes, his successor, as we learn from Strabo, vindicated the authorship of Hecataeus as confirmed by the *Genealogies*, which he apparently regarded as a separate work and above suspicion. When, therefore, Apollodorus set aside the doubts of his predecessor regarding the book of Anaximander he was merely doing what other scholars, ancient and modern, have done. It was only natural that such indications of doubtful authorship as may have been noted in the Alexandrian catalogues should be expunged, once the doubts of the librarians were resolved.

There still remain to be considered a number of passages before we can be sure that we have garnered in all the notices of Anaximander's treatise. Athenaeus,[59] expatiating on the *skyphos*, a cup or goblet, remarks that the name occurs as both a masculine and a neuter noun and is sometimes written *skyphos*, sometimes *skypphos*. In this con-

57 70 B; cf. 410 E.
58 See note 37 above.
59 Athen. 498 A sq.

nection he says, "Similarly Anaximander in his *Heroölogy*, in these terms: 'Amphitryon having parcelled out the booty among the allies and keeping the skypphos (masculine) which he chose for himself,' and again: 'Poseidon gave the skypphos to his son Teleboas, and Teleboas to Pterelaus; this he took and sailed away.'" Athenaeus, you observe, is concerned solely with a grammatical point; it is worthy of remark, however, that he cites as using the form skypphos, besides Anaximander, the poets Hesiod and Anacreon, who employ it, as does Anaximander, as a masculine noun of the second declension, and the epic poet Panyassis, a (somewhat older) relative of the historian Herodotus, who treats it as a neuter noun of the third declension. The agreement at this point of the Anaximander in question with Hesiod, who was older, and with Anacreon, who was but slightly younger, than the elder Anaximander, and the disagreement of Panyassis, junior by over two generations, constitute a point, of no great weight perhaps, but taken for what it is worth, in favor of the elder rather than of the younger Anaximander. But this is not the only possible clew; for Athenaeus cites the title of the work from which the quotations derive. They come, he says, from the *Heroölogy* of Anaximander. This title occurs neither in the bibliography of Anaximander the Elder nor, of course, in that of the Younger, which contains but the one title, *Interpretation of Pythagorean Symbols;* but, as we have seen, whereas in the case of the latter Suidas does not intimate the existence of other titles, in that of the elder Anaximander he prepares us for more by adding to his list "and certain others." If we attach any weight to the bibliographies of Suidas, the finding of a new title attributed to the elder Anaximander can occasion no surprise; but with his namesake the case is quite different. More important, however, than either of these considerations is the circumstance that the title quoted by Athenaeus is identical with one of the titles of Hecataeus. Respecting the latter we do not know whether the *Heroölogy* is another name for his *Genealogies* or *Histories*, or a subtitle of that treatise. It can hardly be doubted, however, that it is one or the other. Bearing in mind the close relation which certainly existed between Hecataeus and his predecessor and the established fact that the elder Anaximander included matters of history connected with the mythical past in the book found by Apollodorus, one cannot reasonably question his claim to these passages from Athenaeus. To assign them to Anaximander the Younger, of whom we know nothing except that he lived more than a century after Hecataeus and wrote an *Interpretation of Pythagorean Symbols* is not critical scholarship, but the renunciation of it.

Now if we attribute the words quoted by Athenaeus, as apparently we are bound to attribute them, to the elder Anaximander, we see both by the title and the contents that he dealt with the heroic genealogies which were studied, as we know from Hecataeus, Pherecydes, and Hellanicus, for clews in regard to early history and geography.[60] The scope of his work or works is thus shown, as indeed we were led to infer from his reference to Danaus and the importation of the alphabet from Egypt, to have included not only the beginnings of the cosmos but also the legendary history of Greek lands. In all such cases, whether known from Greek or Hebrew sources, the geographical and ethnographical status at the time of the would-be historian furnished the starting point which was to be explained by reconstructing the past.[61] Whether it be the story of Creation and the genealogical tables of the descendants of Noah, in the *Book of Genesis*, or the Hesiodic *Theogony* and *Catalogues*, the purpose and the method are everywhere essentially the same: it is the conception of a universal history. One may call it *Genesis*, if one will, or *Physis*, if one prefers;[62] but the central interest of the men who thus set themselves the task of reading the beginnings is always in the earth and its inhabitants as they found them. The description of the earth and its peoples is what constitutes geography, and has always constituted the science. If, as is certain, Anaximander sketched the beginnings of the cosmos and the early history of the Greeks as reflected in the genealogical tables of the heroes, there is no reason why we should doubt that he who constructed a map of the earth actually wrote, as he is reported to have written, a geographical work, which gave the disposition of the peoples and the boundaries of continents and lands in agreement with the pictorial representation of his chart. That was at once the logical thing to do and the thing which by all the tokens we must infer he was most concerned to do.

There is one more reference to an Anaximander which calls for consideration. In Xenophon's *Symposium*[63] the guests are asked to

60 The reference to the goblet, which descended as an heirloom from father to son and then fell into the hands of Amphitryon, the putative father of Heracles, served no doubt as a means of fixing the date of the great hero from whom many royal families, Greek and foreign, claimed descent. The date of Heracles thus became an important datum for history and historical geography. Cp. Hdt. 6.53.

61 See Περὶ Φύσεως, p. 85 sq., especially n. 32.

62 The Greek said not only αἰτιολογεῖν and φυσιολογεῖν, but also in essentially the same sense — γενεαλογεῖν: cp. Hippocr. Περὶ ἑπταμήνου, 4 (7.442 L.) and Aelian, *V. H.* 4,17 καὶ τὸν σεισμὸν ἐγενεαλόγει (Pythagoras) οὐδὲν ἄλλο εἶναι ἢ σύνοδον τῶν τεθνεώτων.

63 C. 3.

mention the thing on which they severally pride themselves, and Niceratus makes it his boast that his father had compelled him to commit to memory all the verses of Homer and that he could still repeat the entire *Iliad* and *Odyssey*. Antisthenes with the tactless jeer of the Cynic retorts that all the rhapsodes can do as much and that, as every one will acknowledge, there are no greater simpletons in the world than they. To keep Niceratus in countenance and prevent a possible scene, Socrates with fine urbanity suggests that the stupidity of the rhapsodes is due to their failure to learn the hidden meaning of the poet which is given in allegorical or symbolical interpretation; "But you, Niceratus," he adds, "have paid large tuition fees both to Stesimbrotus and Anaximander and to many others, so that nothing of great value has escaped you." Here then we meet an Anaximander who interprets texts in a manner to bring out their hidden meaning. Nothing more is said about him. Can we with probability identify him with either the elder or the younger Anaximander of our inquiry?

In confronting this question it is necessary to recall the context. As Niceratus does not assert that he has sat at the feet of Stesimbrotus and Anaximander, and does not even assent to the statement of Socrates, which was obviously prompted by a desire to preserve the good feeling of the feast, we are under no obligation to credit Niceratus even with a knowledge of the methods of interpretation practised by Stesimbrotus and Anaximander, much less with having actually studied in the schools of these masters. If Socrates under the circumstances in his ironical manner told a white lie, his well-bred table companions would appreciate and acquiesce in his suggestion. Indeed it is not impossible that with his characteristic plain speaking Antisthenes meant to imply that Niceratus was of a feather with the rhapsodes with whom he flocked. Be that as it may, we are not warranted in pressing the passage to prove either that Stesimbrotus and Anaximander conducted schools in which they gave instruction and received tuition fees, nor that Niceratus attended them. If we assume that Niceratus owed them any instruction, he might equally well have derived it from their books. With regard to the date also we may take a similar view. As the scene of the Xenophontic *Symposium* is laid in the year 421 B.C., strict consistency would require that the supposed masters of Niceratus had taught or had at least published their works before that year. This would be true of Stesimbrotus, but would hardly hold of Anaximander the Younger, if his *floruit* was properly given at 405 B.C.; for in 421 he would have been about 23 years of age. However, an anachronism of this sort on Xenophon's part should not rule the latter

out. Again, it is not necessary to assume that all the 'teachers' of Niceratus practised their hyponoetic interpretation on Homer. Stesimbrotus, who wrote about moot questions in Homer, may be acknowledge to have done so; Anaximander the Younger, who interpreted the Pythagorean symbols, may be said to have fulfilled all that the words of Xenophon require us to suppose if, as is altogether probable, his method of exegesis was essentially the same as that applied to the poets.

Of the elder Anaximander we have not spoken in this connection because very little can be said in favor of him in relation to the hyponoetic interpretation presupposed by the passage from Xenophon's *Symposium*. It is true that indications are not wanting of somewhat allegorical interpretations of Homer at the close of the sixth century B.C.; but neither is there any evidence that the practice dates back to the middle of that century, nor is there anywhere a hint that the great Milesian would have concerned himself with it, if it did. It was rather in the latter half of the fifth century that the method which was destined in time to enjoy great favor and an extended application won its first laurels. Hence we may with tolerable confidence identify the Anaximander of Xenophon's *Symposium* with Anaximander the Younger, the interpreter of Pythagorean symbols.

If our results are assured we have added at least two brief verbatim fragments to the one previously allowed to have come from the book of Anaximander, the reputed originator of Greek prose. Of these fragments it is not necessary now to speak at length; it is perhaps deserving of mention, however, that in point of style they closely resemble not only the fragment communicated by Simplicius but likewise the fragments of Hecataeus. Of the three the sentence quoted by Simplicius is the most complex; for the most part their structure is exceedingly simple, no elaborate periods being attempted; but there is no want of precision or lucidity. Hecataeus, as far as we can judge, made no advance in this respect; even Herodotus in general constructed his sentences on the same model, only occasionally betraying the influence of fifth century sophists. It would therefore be as proper to speak of Herodotus as primitive as it would of Anaximander. That Simplicius should think the terms used by Anaximander rather 'poetic' is only a compliment to the imaginative vigor of his speech.[64]

64 V^3 I. 15, 29. There is nothing really 'poetic' about the phraseology of Anaximander; the style is imaginative and more or less elevated, but less so than that of Heraclitus. It was probably due to the theory that prose in Anaximander's time was new, being recently introduced to supplant verse,

Though Anaximander and Hecataeus of course used Ionic forms, the distinctive differences from the Attic have almost entirely vanished in the course of transmission.

II.

Our survey of the tradition regarding Anaximander's book shows that it touched on matters not germane to a philosophical treatise, properly so called. This fact raises a variety of questions which are of importance in relation to the history of Greek philosophy; for though Thales is commonly regarded as the originator of this kind of inquiry, we know so little of his scientific work that it is only with his successor Anaximander that we begin with a certain assurance to discern the character and direction of thought cultivated at Miletus, the city which bred the new interests destined to have an illustrious career in the western world.

Were it profitable to express a feeling of regret, perhaps the greatest loss to history might be said to be that which virtually blotted out the story of this ancient city of Miletus, the pride of Ionia. Even the excavations conducted there in recent years have produced almost nothing: one gratefully excepts the headless statue erected by appreciative contemporaries to Anaximander, showing that they valued him even in his lifetime. What we need to remember is that Miletus even in his day had passed the zenith of its power: it is always in the afternoon or evening of a civilization that man turns to reflection on the world, its origin and its destiny.[65] Of the earlier period, in which Miletus ran its feverish course of unexampled activity, there are no written records extant: like the good mother she was, she lived on in her almost countless children, the colonies she had planted. Among the last of these was Apollonia, which Anaximander served as founder.

Thales seems to have lived to an advanced age and to have died about the same time as Anaximander. There is every indication

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that Simplicius added the reference to the poetic style. See Strabo 1.2,6 C. 18. In reality Anaximander may quite possibly have derived his form of expression and the suggestion of the cosmic process in question from a curious practice observed in his home, which Strabo reports (12.8,19 C 580): *φασὶ δὲ καὶ δίκας εἶναι τῷ Μαιάνδρῳ, μεταφέροντι τὰς χώρας, ὅταν περικρουσθῶσιν οἱ ἀγκῶνες, ἀλόντος δὲ τὰς ζημίας ἐκ τῶν πορθμικῶν διαλύεσθαι τελῶν.*

65 It is well to recall that Theophrastus, the first formal historian of philosophy, was not of the opinion that it really began with Thales. Simplicius (*V*[3] 1.12,34) says, *Θαλῆς δὲ πρῶτος παραδέδοται τὴν περὶ φύσεως ἱστορίαν τοῖς Ἕλλησιν ἐκφῆναι, πολλῶν μὲν καὶ ἄλλων προγεγονότων, ὡς καὶ τῷ* [probably we should read *αὐτῷ*] *Θεοφράστῳ δοκεῖ, αὐτὸς δὲ πολὺ διενεγκὼν ἐκείνων ὡς ἀποκρύψαι πάντας τοὺς πρὸ αὐτοῦ.*

that they formed the nucleus of a group of men, their fellow-citizens, among whom certain intellectual interests were cultivated. It is perhaps misnaming this circle to call it a school; but it was destined to become the parent of all the 'schools.' One thinks of the circle formed by Franklin at Philadelphia, which eventually became a university: but Franklin had models to copy, while Thales and his fellows pretty certainly had no predecessors who worked in the same spirit.

What, we naturally ask, were the interests which inspired the goodly fellowship at Miletus to organize this first 'college?' They must have been related to the life of the group and of the city; but there is no indication that in the beginning political questions, questions that is concerning the government of Miletus, engaged the attention of the group. They were citizens, of course, and shared the life of the city; but it is as statesmen concerned with larger issues that we hear of them. Thales proposed the unification of Ionia into a federal state; what Anaximander may have done to win the honor bestowed on him we can only conjecture; Hecataeus, one of the last of the 'school,' was prominent as an elder statesman at the time of the Ionian Revolt. But of such political activity, looking to the control of the government of their city, as appears in the circle of Pythagoras, we have not a hint; though it is more than likely that Pythagoras, in this as in other respects, was inspired by the example of the Milesian 'college.' The discussion of the principles to be followed in founding colonies, in which Anaximander at least participated, inevitably led to the consideration of the ideal city; that it was a topic discussed by the Milesian 'school' goes without saying, but is abundantly clear upon reflection, for city-planning and the utopian schemes of the Greek historico-geographical tradition everywhere lead back to the Milesians of the sixth century. Such ideals quite naturally arose in a city with far-flung colonies and with relations, through Naucratis, with Egypt, which in the entire Greek tradition appears as the utopia *par excellence*.[66]

Aside from the direct reports regarding Thales, Anaximander and Anaximenes, who for us at least constitute the Milesian 'school of philosophy,' the best evidence we have regarding that memorable circle comes from our knowledge of the men most influenced by this triad. Leaving out of account those who are said to have had relations with 'the philosophy of Anaximenes,' because their debt is too special, we think necessarily of Pythagoras, Xenophanes and Hecataeus,

[66] Of this I hope to treat at length on another occasion.

the three whom, with Hesiod, Heraclitus rebuked for their polymathy, which failed to teach them understanding. This list is not the product of chance; for a clear line, running from Hesiod through Thales and Anaximander, leads us to Pythagoras, the mathematician, to Xenophanes, the rationalist interested in ethnography and history, and to Hecataeus the geographer, historian, and naturalist. Heraclitus is said to have testified to the interest of Thales in astronomy, and Eudemus called him the father of geometry. The latter also, apparently, is responsible for the data we have for Anaximander's ideas regarding the magnitudes and intervals of the heavenly bodies and for the statement that he outlined the subject of geometry.[67]

How these several intellectual interests were cultivated in the Milesian circle, we do not know; but it is not difficult to discover a relation between their studies and the problems which crowded upon the intelligent citizens of Miletus. Thus Thales was credited with a work on nautical astronomy[68] and with various nautical devices natural in the busiest trading center of the Levant, whose sailors went everywhere. Of similar interest was presumably his study of the calendar. As for the pursuit of geometry, its relation to city-planning and to the allotment of lands was well recognized in antiquity; the relation of both astronomy and geometry to geography was no less distinctly seen.[69] The schematic geometrical treatment of the early Ionian (Milesian) maps is known to every student of ancient geography: hence we need not suppose that Eratosthenes first brought geometry to the service of cartography.

In the busy streets of Miletus there met men who had voyaged to Egypt and seen the Ethiopians, snub-nosed and dark of skin, and to Thrace, and knew its blue-eyed and red-haired inhabitants:[70] one could gather there, even without travel, to which every Milesian must have been tempted, the most varied lore about all sorts of strange peoples and their customs. Pretty nearly everything we learn of the 'barbarians' before the close of the fifth century comes ultimately from early Ionian writers. They interested themselves also in the progress of civilization and the steps and 'inventions' whereby it was advanced.[71]

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67 *V*[3] I. 19, 12, I. 14, 22.

68 Whether it really belongs to Thales or not — and this is not clear — the work was undoubtedly quite ancient.

69 See Strabo 2.5 and Ar. *Nub.* 201 sq.

70 Xenophanes *fr.* 16 Diels.

71 Xenophanes *fr.* 18 Diels; cp. the interest shown by Herodotus in the contributions of various foreign lands, especially Egypt and Babylonia, to Greek civilization. Strabo 2.5,18 expresses the thought which underlies the historico-geographical tradition from the beginning.

But all this store of information was in the true Greek manner to be somehow set in order and brought into relation to the time and place in which they found themselves. How consciously these early Milesians worked we do not know; but the result of their labors is writ large in the physiognomy of Greek science.

Hesiod occupies a strangely anomalous position in Greek literature. The Homeric epic, at least in its finished form, is acknowledged to be the product of Ionia. After their childhood days, in which the Ionians gave themselves to telling tales of the long ago merely for the delight they took in heroic adventure, ensues an age of almost total eclipse of this extraordinary people, from which it emerges in the sixth century, past its prime and in a measure decadent. When it thus again comes to view it is engaged in writing treatises in prose on scientific themes. Meanwhile, for us, the connecting link between the heroic epic and the sober prose of science appears in Hesiod, not in Ionia, but in the Mother Land, which was, intellectually considered, centuries behind the Greeks of Asia Minor.[72] It is perhaps idle to speculate, but one cannot refrain from asking how this fact is to be explained. Can we believe that there was really a lapse of consciousness in Ionia and that when the people suddenly awoke, they took the cues of their intellectual life from Greece Proper? Would it not be more reasonable to suppose that the beginnings of Ionian prose lie in that dark age, the general substance of the attempts of the Ionians at reconstructing their past being worked up by Hesiodic poets who borrowed their ideas from contemporary Ionia and the form from the Homeric epic?[73] If we could assume that the first 'theogonies' and 'catalogues' were in prose, we should be able to account both for their disappearance and for certain characteristics of the Hesiodic poetry itself.

Be that as it may, Miletus in the sixth century has definitively broken with the Hesiodic and Homeric past. It is not in a mood for poetry: the gods have melted away in the cosmos, and genealogies are useful solely as materials from which one may by criticism and combination extract history.[74] Miletus is at a certain point on a map of the earth, which has its assignable place in the cosmos. The

72 The importance of Boeotia, for example, in the early development of Greek religion cannot be denied; but this very fact, especially in view of the character of this religious movement, is really the best evidence of the essentially different attitude of the motherland. Ionia tended to secularize and rationalize everything.

73 Tradition said that Hesiod's father came from Cyme in Aeolis, on the border of Ionia; if this is legend, it is at least *ben trovato*.

74 One must be dull indeed to miss the fine irony of Hecataeus' reference to his descent from a god in the sixteenth generation (Hdt. 2.143).

Milesian who walks its streets feels himself likewise at a definite point of time, and he sets about reaching backward to fixed points in the past in order to reconstruct a chronology. His immediate data are furnished by family traditions, and an approximate, limited scale is constructed by using the generation as a unit. The absolute scale was not to be found in Greece: Hecataeus discovered it in the immemorial civilization of Egypt with it records running back thousands of years. The connection between the Greek and Egyptian scales, and therefore the control and placing of Greek dates in relation to the absolute scale, were brought about by certain identifications, no matter how arbitrary they may have been. These are the methods of a thoroughly rational and conscious science: they have been refined in the course of time, and the admissibility and validity of certain data have been more sharply scrutinized; but historical science in all its essentials was achieved in Miletus before the close of the sixth century.[75] This, as historians recognize, is the dawn of the historical period in Greece; and here we first find really historical dates. Dates for a generation or two farther back are approximately correct, as one might expect; beyond that we have, so far as Greek sources are concerned, nothing intrinsically different from the data with which the Milesians themselves had to deal.

This was the crowning achievement of the Milesians, and we are justified in regarding it as the expression of the dominant interest of the Milesian 'school.' To this result the several members of that epoch-making circle made their contributions. Anaximander, as we have seen, concerned himself with geography and history as well as with cosmology. We should like very much to know more about his book; but everything beyond what we have already said must be learned by inference.

There are two classes of facts from which permissible inferences may be drawn regarding the character of Anaximander's book. One consists of the testimony of the ancients regarding it and the opinions of its author. Of a part of these data we have already taken cognizance; others we have still to consider. When we shall have completed the review of the contents of the book, and drawn such inferences from them as appear to be justified, we shall be in position to institute a new inquiry: to wit, whether other works of like character existed, or still exist, from which one may draw further inferences.

Anaximander is generally regarded as a philosopher: hence we will begin with such opinions as seem to justify that title. He dealt, we

75 This I expect to show more fully on another occasion.

are told, with the origin of the cosmos. Out of the Infinite it came: into the Infinite it will be resolved. The cosmos is described, and its constituent members are placed in due order with their intervals noted, the earth being at the centre. This world is but one of an infinite number, past, present and still to come. These worlds may be called gods. Certain phenomena of the cosmos are noted and explained. The earth does not lie in the plane of the zodiac, but the latter runs obliquely about it. The nature of sun, moon and stars is set forth, and eclipses are explained. He explains also the origin of the sea and the reason why it is salt, and offers explanations of various meteorological phenomena. Aristotle treats most of these topics in *De caelo*, *De generatione et corruptione*, and *Meteorologica*.[76]

One recurrent note cannot fail to arrest the attention: it is the quest after origins, and the glance ahead, seeking to divine the end. Whence and how the cosmos arose, where it will vanish at last; how the sea originated and became salt, and how in the end it will quite dry up:— these are, one may say, the all-inclusive questions, giving the setting of the whole and providing for matters in detail of lesser importance. Judging by our records, the outlook of Anaximander is in the last analysis historical. It is in keeping with this point of view that, as we have seen in tracing the record of his book, Anaximander displayed an interest in heroic genealogies and in the origin of writing, a question then as now of vital concern to the historian, because the use of writing is the precondition of the existence of records serviceable for history. Of like character are the questions, to which we know Anaximander addressed himself, concerning the origin of land animals and especially of the human species.

That Anaximander concerned himself with geography we know. We have tried to point out the actual, or at any rate the possible, relation to his geographical studies of his pursuit of geometry and his use of the gnomon. But this instrument had obvious uses also in determining the calendar, which is the basis of chronology and of history; for history without definite measures of time is impossible. History and geography go necessarily together: in Greece they formed from the beginning a unit, geography being generally treated in excursus in the historical narrative. It was only by Ephorus and Polybius that geography came to be set apart as distinct books, though embodied, as were the earlier geographical excursus, in works by inten-

76 The importance of Aristotle's *Meteorologica* for the spirit and contents of Milesian science does not seem to be fully recognized,— probably because he does not often refer to his predecessors by name.

tion and predominant interest historical. This statement would be paradoxical, were it not for our knowledge of Hecataeus and Herodotus: even where the predominant interest is apparently geographical, the geographical account falls within the historical scheme. In describing countries which furnished no historical clues the *status quo* of course alone was given.

When one tries to form a conception of Anaximander's book, one thinks inevitably of Hecataeus, his successor, who can hardly have remained uninfluenced by his example. As we have before remarked, the traditional titles applied to the work of Hecataeus are numerous; two, however, are clearly inclusive of the rest, (a) *Histories* (or *Genealogies*) and (b) *Tour of the Earth*. In later times these were regarded as separate treatises, but it is far from certain that they were originally and to the mind of their author distinct. Two facts point rather to the conclusion that they were conceived as a unity. First, we know of only one introduction, in which the author gave his name, and that was prefatory to the *Genealogies*. Secondly, the *Tour of the Earth*, being evidently without express mention of its author, was mistakenly assigned to Nesiotes, and therefore the claims of Hecataeus were for a time disputed. The statement sometimes made[77] that the *Tour of the Earth* was composed before the *Histories*, is wholly without foundation. Logically the *Tour of the Earth*, having regard primarily for the *status quo* in its author's time, follows the *Genealogies*, which treated of the past. If we assume that Hecataeus composed his treatise as a single work, which was subsequently divided for convenience, the facts known about it are most readily explained.[77a] To be sure, we are thus led to postulate in the sixth century an historico-geographical treatise in size comparable perhaps to the *Histories* of Herodotus. To some this may seem incredible: perhaps they shall have to revise their preconceived notions regarding what was possible in sixth century Miletus.

If we ask where in such a treatise, as we suppose Anaximander's

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77 Jacoby, col. 2741–2.

77a That the Γενεαλογίαι and the Γῆς περίοδος were not really distinct but merely separated, either arbitrarily or for practical purposes, is indeed not susceptible of strict proof, but is both in itself probable and suggested by analogy. Strabo 7.3,9 C 302 quotes from the (geographical) fourth book of Ephorus [*fr.* 76 Müller] the statement that Phineus was borne by the Harpies

Γλακτοφάγων εἰς γαῖαν, ἀπήναις οἰκί' ἐχόντων

as derived from Hesiod's Γῆς περίοδος, a passage which Rzach [*fr.* 54], following Schoemann, *Diss. de comp. Theogoniae Hesiod.* p. 20, is certainly right in assigning to the Hesiodic *Catalogue*. In the same way it is quite impossible to dissociate Anaximander's Γῆς περίοδος from his Ἠρωολογία.

to have been, certain questions on which he held opinions may have been discussed, we again look to the models which have come down to us intact. Let us take Herodotus and Strabo as examples. The debt of Herodotus to Hecataeus is acknowledged. We may well suppose that it was the *Tour of the Earth* to which the fifth century historian was chiefly indebted,[78] though he unquestionably used also the *Genealogies*. Now Hecataeus clearly gave no cosmology: so far as he interested himself in matters pertaining to meteorology and kindred fields of science, he brought forth his opinions in connection with the description of particular lands, especially of Egypt. After Anaximander the 'school' of Miletus seems to have had a fate similar to that of Aristotle: where the master, in the true encyclopedic fashion, sought to cover the whole field of science, his successors divided the field. There is no evidence that Anaximenes gave any thought to geography and history, and the same is true of those who are brought by tradition in relation to 'the philosophy of Anaximenes'; while Hecataeus, as has already been remarked, neglected cosmology, and devoted himself to history and geography. Herodotus, though with inadequate comprehension of the spirit and the achievements of the Ionians, was inspired by the example of Hecataeus and Dionysius, thus falling roughly in line with their branch of the tradition originating at Miletus.

Another branch of the tradition can be traced through Eratosthenes to Strabo: it is largely indebted, however, to the collateral line which is concerned primarily with history. Geography, as we have previously remarked, had come to occupy a place apart as an independent science. Whether Democritus was at least in part responsible for this innovation we cannot say; certainly Ephorus, by separating his geographical books distinctly from the historical, contributed not a little to this result. Eudoxus certainly conceived his geography as related to his astronomy. In Eratosthenes, as in Strabo, the discussion of the earth, as the subject of geography, is made to follow that of the cosmos.[79] Anaximander had done the same, describing the circles of the celestial bodies with the earth at their centre. Here, then, we have those parts of his treatise to which could be given the titles *Sphere* or *On the Fixed Stars*. This, we may be sure, formed the

78 See Hecataeus *fr.* 292. Jacoby tries to determine in detail the debt of Herodotus to him.

79 See Strabo 1.4,1; 2.5,1 sq. Strabo is himself so much occupied with his criticism of Eratosthenes that he cannot describe the cosmos, though he recognizes that the beginning of the descriptive part of geography is the proper place for the astronomical setting of the earth. Strabo 1.3,3 C 48 sq. is important for the relation of the discussions περὶ φύσεως to geography.

beginning of his treatise. It is a matter of no small interest, however, that we find not only in Strabo but in Diodorus also a second cosmology introduced in their accounts of Egypt.[80] This fact can hardly be due to anything else but the force of literary tradition. There were those who had discussed the earth both in relation to the heavens and to the geological history of our planet in connection with Egypt, with which they must have made a beginning. One may plainly see the results of this practice in Herodotus, traces of it being visible throughout the entire geographical tradition. Hecataeus, as we have already remarked, set forth his own geological opinions chiefly in his account of Egypt; but the observations upon which his opinions were based, such as the presence of fossils in the stones of the pyramids, were not new in his day, as we chance to know that Xenophanes had previously made similar observations in other places. There can hardly be a doubt regarding the source of the latter's interest in such evidence, since his relation to the earlier Milesians is unquestionable. How significant these facts are may be seen when one considers another point. Later geographers regularly began their description of the *orbis terrarum* with the Pillars of Hercules, passing clock-wise round the Mediterranean. Now, if it be true, as has been plausibly maintained,[81] that Hecataeus of Miletus began his *Tour of the Earth* with the Pillars of Hercules, proceeding clock-wise about the *orbis terrarum*, the whole of Europe and Asia (proper) had been traversed before he reached Egypt. That under these circumstances he should have paused at this point to give a detailed account of the earth and its formation would seem to call for an explanation, the need of which is further emphasized by the fact, already mentioned, that even the

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80 Strabo 17.1,36 sq., referring back to 1.3,4. Much that in the latter passage is referred to Eratosthenes and Strato can be shown, by reference to the second book of Herodotus, to come from the early Ionians. In Diodorus the situation is especially significant, because he begins his history with Egypt. The result is that the same themes are twice discussed (1.6–8 and 1.10 sq.) in close succession with a clear break between. The matter has been discussed, though with little intelligence, by K. Reinhardt (*Hekataios von Abdera und Demokrit*, Hermes XLVII, 496 sq.), who tries to get rid of the break. The duplication is clearly due to the amalgamation of two lines of tradition, one of which began with a cosmology proper while the other, though not wholly ignoring cosmology, treated of the φύσις γῆς as introductory to the study of Egypt, with which history and geography began. Both lines of tradition began with the ancient Milesians, and for a time were separated, only to be reunited at the last with the signs of the imperfect combination left to tell the tale.

81 See Jacoby, col. 2691.

late historians like Diodorus, and geographers, like Strabo, at this point insert a cosmology.[82]

This phenomenon, hardly to be explained except by the conservatism of literary tradition, raises the question whether Hecataeus, like his successors, was not herein betraying the influence of his predecessors. But of predecessors of Hecataeus in this field we know Anaximander only, unless we should assume that Thales also was in some sense a geographer. For Thales, however, there is no direct evidence whatever. Nevertheless there is a point that deserves consideration in this connection. Almost the sole doctrine attributed to Thales is that all things come from water: which Aristotle and Theophrastus interpret with reference to the origin of life. Now Anaximander likewise expressed opinions regarding the origin of life, animal and human; and he also held that it originated in water, as with the gradual progress of evaporation of the once all-engulfing sea dry land emerged. But not only Herodotus, but the entire Greek tradition, where reference is not had to such myths as that of the creation of man by Prometheus, represent the 'scientific' theory of the origin of life as brought into relation with the swamps of the Nile Delta. There fishes were spontaneously generated; there existed the ideal conditions for the beginnings of life; there was the cradle of the human race and the fountain head of civilization. There, we may with reason assume, Anaximander (and perhaps Thales) laid the scene of the early life history of the earth.[83] But if this were true, the work in which Anaximander set forth his theory of the origin of life would bear a definite relation to the later known works of the historico-geographical tradition. The derivation of the alphabet from Egypt through Danaus proves that Anaximander shared the view which sought in that land of many wonders the beginnings of civilization.

It is quite possible also that many of the explanations of meteorolog-

82 The 'cosmology' is in any case embryonic, and may more properly be called a brief treatise Περὶ φύσεως. What signifies is not so much the content of the account (although here also tradition was strong), since the explanation of the world and the formation of the earth, of the *origines* in general, necessarily varied with the philosophical school to which the writer belonged, as the bare fact that an explanation of any sort was given at the particular place in the general economy of the treatise; for this, as one clearly sees from Strabo, was a matter of constant discussion, in which tradition ruled. Strabo 2. 5 is here invaluable as showing the topics properly treated at the beginning of a descriptive geography.

83 On another occasion I hope to show in considerable detail how much of early Milesian science was concerned with Egypt. A critical study of Egypt as it appears in the Greek tradition will serve to elucidate at many points the thought of the Milesians, including Anaximander.

ical and other phenomena which Theophrastus and his successors found in Anaximander's book were scattered through it and were offered in connection with various lands or places. Not only the second book of Aristotle's *Meteorologica*, but the various historical and geographical treatises also which survive from antiquity in whole or in part, afford sufficient examples to justify such a theory. It is not necessary to assert that this was true of Anaximander's book; it suffices for our purposes that it may be true. For a consideration of the character of the doxographic record of his opinions will readily show that it affords no presumption whatever regarding the form of his treatise. Through the genius of Professor Diels [84] we are enabled to gather from the welter of late extracts a view of the *Opinions of the Physical Philosophers* of Theophrastus, the disciple and successor of Aristotle, from which ultimately derive most of the statements regarding the doctrines of the early thinkers. That work, as we see, was a systematic account of Greek philosophy arranged under heads following closely the order which Aristotle himself had used in his treatises. Thus the arrangement is that of the Peripatetic historian and bears no necessary relation to the order in which the early 'philosophers' set forth their opinions. What we know, moreover, of the method of Theophrastus, who was wholly under the influence of his master, suggests caution in respect to the 'philosophical,' that is to say especially the metaphysical or ontological, doctrines which he reports; for both Aristotle and Theophrastus were prone to discover in statements intended as descriptions of physical processes a deeper meaning which would bear a metaphysical interpretation.

Now it happens that Theophrastus, following Aristotle, allowed no place in his scheme for matters pertaining directly to history and geography. We cannot, therefore, be surprised that the doxographic tradition contains no hint of Anaximander's services in these directions: they were not germane to the 'physical philosopher' with whom alone Theophrastus was concerned. Strictly speaking, to be sure, this statement is at best a half-truth. Theophrastus, like Aristotle, speaks not of physical *philosophers*, but of *physikoi* or *physi-*

84 In his *Doxographi Graeci*, Berlin, 1879. A serviceable summary is given by Professor Burnet, *Early Greek Philosophy*,[3] pp. 31 sq. On p. 181 sq. Diels gives a table of the contents of the 'Vetusta Placita' or the 'Posidonian Areskonta,' which most fully represents the original Φυσικῶν δόξαι of Theophrastus. One sees that it includes, besides the topics treated in Aristotle's *Metaphysica*, *De caelo*, *De generatione et corruptione*, and *Meteorologica*, the subjects which belong to his *De anima* and the lesser psychological treatises and also a large group of questions discussed by medical writers who wrote Περὶ φύσεως.

ologoi, meaning thereby those who discoursed about *physis*. Having elsewhere treated of the latter term I have no intention of taking it up afresh. Suffice it for the present to say that men of the most diverse interests in detail had in the fifth century much to say about *physis* who never found their way into the group recognized as physikoi or physiologoi by the doxographic tradition. When one considers the members of the group in detail, and the questions which were noted as falling within the purview of the historian of their opinions, one sees that the classification, though intelligible from the point of view of Aristotle's conception of philosophy, is altogether arbitrary as regards the fields of knowledge cultivated by men of science in that day. Opinions relating, or supposed to relate, to 'material' and 'efficient' causes, to cosmology, to the more important meteorological and terrestrial phenomena, to the gods, to the soul and its faculties, and to the more striking physiological functions, were included; such as concerned the biological sciences, zoölogy and botany, and the fields of history and geography, were ignored. It is the same process of selection which, at a later stage, determined the choice of those among the writings of Aristotle that should have the honor of a commentary; only in the latter instance the interest of the schools in logic led to the inclusion of the *Organon*.

The same inconsistency is found in regard to the title *On Nature* (Περὶ φύσεως). Probably the earliest extant reference to this catchword as a title occurs in the Hippocratic treatise *On the Old School of Medicine*:[85] "Certain persons, physicians and sophists, assert that no one can know medicine who doesn't know what man is, how he originated, and whereof he was framed at the start: that is what he must fully learn who would properly treat men. But their proposition relates to philosophy, like Empedocles or others who have written *On Nature*." Earlier references in the fifth century are to be found in Euripides and elsewhere, but hardly so pointedly or so clearly to titles of treatises. Finally, as in Galen,[86] we find it the generally

[85] Περὶ ἀρχαίης ἰητρικῆς, 20.

[86] V^3 I. 131, 18. Besides the persons specifically mentioned by Galen the following are elsewhere cited as having written Περὶ φύσεως: Anaximander, Xenophanes, Heraclitus, Orpheus, Anaxagoras, Diogenes of Apollonia, Metrodorus, and Zeno of Citium. In my Περὶ Φύσεως I spoke somewhat at length regarding the dominant interests of these treatises. A more intensive study of the historico-geographical tradition since I wrote that essay has not only confirmed my general view but has taught me much besides, especially in regard to the mutual relations of the early scientists in their several fields. If I ever set forth my conclusions as a whole it will have to be done in a history of early Greek science, which I have contemplated for many years.

accepted name: "All the treatises of the ancients were entitled Περὶ φύσεως,— those of Melissus, Parmenides, Empedocles, Alcmaeon, Gorgias and Prodicus, and all the rest." This is no rational classification: it is an omnibus label which gives no guaranty of the contents of any particular work to which it may be applied.

Hence we attach no importance to the fact that Themistius calls Anaximander the first Greek who to our certain knowledge ventured to write a treatise entitled Περὶ φύσεως, and that Suidas reports the same title alongside the others, which we have already mentioned, — *Tour of the Earth, On the Fixed Stars,* and *Sphere.* One is as well attested as the other; but all the other titles have this advantage over Περὶ φύσεως that they suggest something definite, and likewise true, of the contents of Anaximander's book. Regarding this work we may say with confidence that it was conceived as a single whole and was presumably brief in comparison with the treatise of Hecataeus. The peculiar way in which Eratosthenes speaks of Anaximander in contrast with Hecataeus does, however, suggest the question whether the distinctly historico-geographical part of his book, which might properly be called *Tour of the Earth,* had not, like the similar portion of Hecataeus' work, become detached and had so come to lead for a time a separate existence until reclaimed for its author by Apollodorus, who discovered in it historical data calculated both to fix its author's date and to place his identity beyond question.

III.

We have spoken of the doxographic tradition and noted briefly its scope. Deriving immediately from Theophrastus, who was concerned with the φυσικοί, it revealed the conception he had of them and of the interests which properly characterized them. He does not expressly call them philosophers, but as such of course he regards them. We have already pointed out how closely the scheme of the Φυσικῶν δόξαι followed the order of topics in the systematic works of Aristotle and have remarked that in substance also, that is to say in his interpretation of the data regarding the early thinkers, Theophrastus (except possibly in a few instances) adhered to the views of his master. This was the more natural because Aristotle himself was wont to report briefly the opinions of his predecessors as furnishing the proper basis for a discussion of the several questions with which he had to deal. It is almost as if Aristotle had had at hand for the purposes of his lectures a brief digest of the earlier history of philosophy. What

Theophrastus did was in effect to expand these pronouncements of his teacher, using where he could the original texts for fuller statements, and criticising the views reported at greater length. Thus in a real sense the doxographic tradition is essentially Aristotelian. Now with the advance in the critical study of early Greek thought it has become increasingly apparent that Aristotle, with all his advantages and excellences, was not a safe guide for the interpretation of texts. Great as a systematizer and keen as a critic, he lacked the true historical sense; hence the manifest need of going, so to speak, behind the returns, of checking the Aristotelian account wherever possible by other data. Besides the authentic fragments of the early thinkers, to which the historian will have recourse, other sources of information exist, which it is not now necessary to discuss in detail; but it is of some importance to trace this tradition, which we may rightly call Aristotelian, somewhat farther back.

Behind Aristotle stands Plato, to whom we owe relatively few but precious statements regarding the opinions of his predecessors. Possessing perhaps the keenest intellect known to history, he was endowed likewise with that rarest of all gifts, the faculty of entering sympathetically into the point of view of men from whom he radically differed. This is what made him the greatest master of the philosophical dialogue, and might have made him the greatest dramatic genius, had he not fallen under the spell of Socrates. Not a slave to system, but following the argument wherever it might lead, two interests — perhaps, rather instincts — alone seemed to govern his thinking and writing, the love of truth and an innate sense of form. From such a man we may expect, as indeed we receive, reports which, when scrutinized with reference to his intention, are transparently true.

Before Plato we do not find in the works of philosophers references to one another which are of such a character as to yield appreciable assistance to the student of their opinions. There is, however, even here something that may be called a tradition: it concerns the very fundamental matter of the conception of the philosopher and of philosophy. We cannot here pause to review the evidence as to the employment of such terms as 'sage,' 'sophist' and 'philosopher'; but so much may be said to be beyond question: whether the old Milesians did or did not use the terms philosopher and philosophy, a change at least came in their employment by Heraclitus and the Pythagoreans. However much indebted both Heraclitus and Pythagoras were to the Milesians, they cannot have failed to perceive that they were making a distinct departure in their points of view and in

the matters which chiefly claimed their attention. Of Pythagoras, indeed, we are able to judge solely by later Pythagoreans; as for Heraclitus, he has in his own words so clearly expressed himself as to leave no room for doubt. For him the philosopher, though he must of course know many things, does not attain wisdom by much learning; the wisdom of the philosopher lies in the understanding of the unifying and governing principle. Pythagoras might have said that it lay in learning the mathematical formula for the law. This new interest is metaphysical, or at all events akin to metaphysics. It does not, so far as I can discover, appear anywhere in the Milesians; but through Socrates, who was equally influenced by Heracliteans and Pythagoreans, this conception of what marks the philosopher and philosophy descended to Plato and to Aristotle, and so shaped the doxographic tradition.

The interests of the Milesians — chronology, descriptive geography, ethnography, ethnic and biological history — could not be included in the scope of philosophy proper. However scientific their methods and aims, they were then and still remain essentially empirical; however much they may in subordinate matters employ mathematics, principles, such as Heraclitus and the Pythagoreans sought, are not to be discovered there. Only in cosmology might one perhaps think to find an exception; but even here we pass from would-be history among the Milesians to mathematical and descriptive astronomy in the Pythogoreans, of whom Aristotle quaintly says that "they intend to construct a cosmos and to speak in the manner of the *φυσικοί*," [87] when in fact they were merely offering a mathematical construction of it.

From this survey of the doxographic tradition, it becomes apparent that the early Milesians, so far as they appear in it, are out of their element, and in any case could not hope to be represented sympathetically, especially from Aristotle onwards. If they appear at all, it must be in a capacity at least doubtful. Aristotle regarded Thales, Anaximander and Anaximenes as proposing doctrines concerned with ontological principles and with processes of change having metaphysi-

87 *Met.* 1091[a] 18 *κοσμοποιοῦσι καὶ φυσικῶς βούλονται λέγειν.* Actually, of course, they were interested chiefly in very different things; such resemblance as their language had to that of the *φυσιολόγοι* was probably due to one or other of two influences, either to the influence of the Ionians who were really *φυσιολόγοι*, or to that of our common way of thinking, which generally gives even to purely abstract and mathematical constructions a time-form. Hence the debate regarding the question whether Plato ascribed to the cosmos an origin in time.

cal implications. We have no intention of debating here the question whether in any or all of these matters he was right or wrong: for our purposes it is sufficient to say that in no instance is he certainly right, since the opinions in question are quite susceptible of interpretation with reference to purely physical facts or processes.

The influences which we have so cursorily reviewed gave rise to a body of statements of supposed fact and critical judgments, constituting and perpetuating a literary tradition. Properly it is only from Theophrastus onwards that one may call it doxographic; but for our present purposes we may apply this name to the earlier stages also, in which were framed the conceptions which dominate it to the end. Thanks to the intensive study of Greek philosophy and especially to the illuminating analysis of Professor Diels this particular literary tradition can be traced in the main with great precision. The phenomenon is, however, not at all isolated; for every literary kind has its traditions more or less clearly defined. This becomes at once apparent to the student who surveys any series of books on a given subject: the innovations appear trivial in comparison with the mass of purely traditionary matter and opinion. Mathematics, for obvious reasons, presents perhaps the best examples; as Sir Thomas Heath has recently said,[88] "elementary geometry *is* Euclid, however much editors of text-books may try to obscure the fact." These special literary traditions deserve far more attention and critical study than scholars have accorded them.

Now, as we have seen, a considerable field of early scientific thought and interest lies partly or wholly without the scope of the doxographic tradition. Considering the development which can be discerned in Greece from the fifth century onwards we are justified in speaking of it as that of history and geography together, because they were not really separate. To our view this fact is apt to be obscured by the solitary eminence of Thucydides, who breaks the line of continuity and with those whom he immediately inspired forms a group apart. Dealing with a circumscribed area well known to his readers he had no need to digress into geographical descriptions or considerable ethnographic details.[89] But if we disregard Thucydides and his kind, the continuity of the historico-geographical tradition in Greece is palpable. So evident is the wholesale appropriation of matter from predecessors

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88 *Euclid in Greek, Bk. I.*, Preface, p. v.

89 The same is of course true of chronology; for, as Thucydides was concerned solely with the Peloponnesian War, which lasted a few years only, he had no need to discourse on chronology in general.

by successors that an eminent student of ancient history mournfully denounces the procedure as plagiarism.[90] Without concerning ourselves with moral judgments we may content ourselves with signalizing the solid basis of what we call the tradition. Unfortunately there exists for this literary kind no such exhaustive treatise as we possess for the doxographers; but the complexity and the generally fragmentary state of the materials amply explain its absence.[91] Of the historico-geographical tradition we do, however, know enough to be able in most cases to tell whether a given writer belongs to it or not.

Now a survey of our sources of information regarding the earlier Greek thinkers, with whom we are at present chiefly concerned, is worth making for many reasons. We may disregard as sufficiently appraised those which fall to the doxographic tradition; but for Thales and Anaximander we must clearly take account of others. Thus Herodotus refers to the prediction of an eclipse of the sun by Thales, to the report current among the Greeks that he diverted the waters of the Halys and so enabled Croesus to cross, and to his advice to the Ionians to form a federal state in order to maintain their independence; he mentions, besides, the explanation of the Nile floods as due to the Etesian winds, which later writers of the historico-geographical tradition attribute to Thales.[92] We know, then, not to go farther into details nor to pass final judgment in disputable matters, that Thales figured as a man of science in the historico-geographical tradition even before Herodotus. Duly considered this certain fact is of prime importance. It is unfortunate on all accounts that Herodotus

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90 Hermann Peter, *Wahrheit und Kunst, Geschichtschreibung und Plagiat im klassischen Altertum*, 1911. He nowhere shows the least comprehension of the facts of human nature which underlie the creation of a tradition in art and literature.

91 F. Jacoby, *Über die Entwicklung der griechischen Historiographie*, Klio, vol. IX, has attempted a sketch which is the best available, but requires much revision and, in particular, an extension to include the connections of history with other scientific interests. Berger's *Geschichte der wissenschaftlichen Erdkunde der Griechen*[2], 1903, is even less satisfactory for similar reasons, though it has great merits in certain respects.

92 Hdt. 1.74; 1.75; 1.170; 2.20. For the various explanations of the inundations of the Nile see Diels, *Dox. Gr.*, pp. 384–6. Diels (*ibid.* p. 228 sq.) suggests that Pseudo-Plutarch derived these data from Theophrastus; this is possible, but by no means certain. In any case they derive ultimately from works belonging to the geographical tradition, including Hecataeus. Anaximander does not figure in the list, but this is doubtless due either to an oversight or possibly to confusion between him and Anaxagoras, who is credited with an explanation almost certainly older than he. A study of the entire tradition regarding Thales will be found instructive, but would here be out of place.

is the only extant representative of this branch of literature from the sixth and fifth centuries,— in fact down to the time of Diodorus; all the really representative authors in this kind being known solely through detached quotations or fragmentary reports at second or third hand. For Herodotus, though an accomplished writer and an indispensable source for the Persian Wars, comprehended little of Ionian science, and was never deemed worthy of being accounted a geographer until Strabo, almost as superficial as himself, did him the honor of so regarding him. Furthermore, whether from literary affectation or for other reasons, Herodotus often suppresses names and facts which were obviously known to him. Thus it happens that he is for our purposes as little serviceable as one who dealt with the same subject-matter in the fifth century could possibly be. What can be learned from his book has usually to be wrung from him as from an unwilling witness. Anaximander, who certainly played an important rôle, he does not even mention: Hecataeus, to whom he owed the whole of his second book, he names a few times only, and then (in the part borrowed from him) in rather clumsy ridicule. Anaximenes and his 'school' are, as we said above, not mentioned at all except in the doxographical tradition, which clearly points to the conclusion that he did not share the historical and geographical interests of the other Milesians.

If now we turn to Anaximander we find a considerable number of sources regarding him which have no real or original connection with the doxographers. Thus, when Aelian [93] reports that Anaximander led in the colonization of Apollonia in Thrace from Miletus, it is obvious that he derived this datum from some work pertaining to history, whether general in character or dealing with biographies of philosophers. There is no reason to connect this source with Theophrastus or any of his kind. To a similar treatise we must look for the source of the statement, already mentioned, and reported by Favorinus, that he set up a dial at Sparta.[94] From the history of astronomy prepared by Eudemus, who like Theophrastus was a disciple of Aristotle, derive in all probability the data given by Pliny as to Anaximander's discovery of the obliquity of the ecliptic and the date he assigned for the heliacal setting of the Pleiades.[95] Certainly Simplicius cites Eudemus as authority for the statement that Anaxi-

93 *V*[3] I. 14, 25. Cp. Bilabel, Die Ionische Kolonisation (Philologus, Supplb. XIV, I (1920), p. 13 sq.
94 *V*[3] I. 14, 7.
95 *V*[3] I. 15, 1; 19, 17.

mander was the first to set forth an opinion regarding the sizes and intervals of the planets.[96] Eudemus of course regarded Anaximander solely from the point of view of the mathematician and astronomer. But we know that such matters engaged the attention of historians before Eudemus. Herodotus speaks not only of Egyptian mathematic, but also of Thales' prediction of an eclipse; and Hippias of Elis about the same time interested himself in the earlier history of mathematics. To what source Plutarch[97] owed his reference to Anaximander's theory of the origin of man from fishes it is not possible to say. He as well as Censorinus[98] may have derived their information from the doxographers; but there is reason to believe that there was an even earlier tradition on this question among the historians who treated of Egypt.

The data regarding Anaximander's map we have already traced back to Eratosthenes and his geographical treatise. From him derive the statements of Agathemerus and Strabo as well as the other extant references. But one naturally asks whether Eratosthenes had access to a map unquestionably belonging to Anaximander. This possibility cannot be denied;[99] but in view of the evidence that even in Herodotus' day there existed numerous Ionian maps, and of the great probability that charts were both multiplied and modified almost at will, it cannot be regarded as very likely. But, under such circumstances, one must ask, Where did Eratosthenes find the information which justified his statements regarding the charts of Anaximander and Hecataeus? The reasonable answer is surely that they were referred to by historical and geographical writers now lost to us but accessible to him. This is made all but certain by the confident tone in which the charts of Anaximander, Hecataeus and Damastes are mentioned. Statements such as we find in Agathemerus, who depends on Eratosthenes, presuppose a critical discussion of maps and accompanying texts with clear distinctions drawn between the several contributions and indebtedness of geographers in chronological order; and these geographers cannot, as in Herodotus, have been left unnamed or thrown together under the collective title of 'Ionians.' Thus we have every reason for postulating even before

96 *V*³ I. 19, 10. Whether the questionable report of Theon Smyrnaeus (*V*³ I. 20, 20) derives from Eudemus is doubtful; for Theon is known to have drawn on two other sources also, Dercyllides and Adrastus.

97 *V*³ I. 21, 13.

98 *V*³ I. 21, 9.

99 For a remark on the sources at Eratosthenes' command are Strabo 2.1, 5 C. 69.

Eratosthenes a literature dealing with the progress of geography, even if, as is perhaps most likely, it did not take the form of disinterested learned comparison, but consisted of the works of successive geographers who took cognizance of the opinions and charts of their predecessors. Just such criticism is in fact abundant in Strabo, drawn in good part (with express citations) from his predecessors. In other words, there must have existed before Eratosthenes a geographical tradition in all essentials like that which we know from Strabo existed after his time.

It is to this tradition, then, that we owe the record of Anaximander's map. As we have seen, Eratosthenes did not know enough of Anaximander's book to be sure that it was genuine. His own treatise marked the beginning of a new epoch; for it was the first in which a serious, if somewhat too confident, effort was made to describe and chart the inhabited earth on the basis of the newly established shape and dimensions of the earth. We know from Strabo that Hipparchus at many points recurred to the old maps for things which Eratosthenes had discarded. This is hardly explicable except on the hypothesis that the procedure of Eratosthenes was characterized by a radical departure from tradition, which his keen critic could not justify. Such being the case, we can readily believe that Eratosthenes was not an altogether sympathetic student of the earlier geographers. In the first flush of enthusiasm over the new geography the old was naturally neglected. It was only after a generation or two had passed that the texts of Anaximander and Hecataeus were again brought forth from the archives and studied with intelligent interest by Demetrius of Scepsis and Apollodorus,[100] while Hipparchus, like Eratosthenes but apparently in greater measure, displayed a keen interest in the ancient charts. Thus the geographical tradition was assured of a continuity, which for a moment seemed threatened. This continuous tradition makes it possible even now in part to prove, in part to divine, the character of Anaximander's book.

However much prose literature may or may not have existed in Ionia before the days of Anaximander, his book is for us at once the earliest known prose treatise and the earliest known literary document, whether in verse or prose, of the scientific interests of Ionia. As such it naturally possesses a peculiar fascination for us, and we could

100 We know that Demetrius used Hecataeus' book, and was in turn used by Apollodorus. This comports well with the well-known antiquarian interests which experienced a marked revival at Alexandria and Pergamum in the third and second centuries B.C.

wish to know far more about it than the grudging record vouchsafes. It is perhaps possible even yet by a close scrutiny of the whole early tradition to gather certain further data in detail regarding his opinions and the structure of his chart; but of the economy and spirit of Anaximander's book we seem with our present resources to be able to learn no more than we have above set forth. A part even of this is of course not susceptible of strict proof; but we have endeavored to conduct our inquiry with due regard to the evidence and the principles which must be observed in historical studies. Though Anaximander was apparently a name not uncommon in Miletus, we do not meet it elsewhere; and the literary tradition seems to have recorded two persons only of that name as authors of books.[101] We have therefore to choose between them when it is a question of assigning a datum attributed simply to 'Anaximander'; and the result of our inquiry is what one might reasonably have expected. The name 'Anaximander' must have suggested to the Greek the great Milesian of the sixth century as naturally as the name 'Jefferson' or 'Washington' suggests to an American the well known personages of our own history. That another writer of the same name and born in the same city was known is indeed clear from the record; but the sole reference to him outside the entries of a biographical and bibliographical nature is of a sort to lead naturally to his identification, even though he is not expressly called 'Anaximander the Younger.'

Anaximander's book must be seen in its true perspective, that is to say, in relation to the tradition of which it was a part. Whether it stood at the head of the series or itself had predecessors, we do not certainly know; but of its successors we may discover enough to discern in part the lines of connection. From Anaximander onward we can trace several streams of tradition growing in volume and progressively differentiating themselves until they give rise to quite distinct and special sciences. One takes on the form of cosmogony or cosmology and a study of the microcosm, the latter developing into scientific medicine;[102] another begins as history with a geographical appendix, which in time constitutes a science apart. Mathematics and cosmography, fructified by a new interest born partly of Orphic and other religious speculations, give rise to new points of view and to

101 This is certainly implied in the name 'Anaximander the Younger.'

102 In this study I have chosen for various reasons to say little or nothing of the medical tradition. One reason is that in my Περὶ Φύσεως I treated of it at some length, the other, and more important, is that no intelligent study of the *Corpus Hippocrateum* in relation to the earlier history of medicine exists. The clue, I believe, lies in the treatise Περὶ ἀρχαίης ἰητρικῆς; but I have not found the leisure to follow it up.

questions which in their development eventuate in metaphysics or ontology,[103] and determine the history of philosophy, as they shape the doxographic tradition. The latter, though dominated by alien interests, depends perforce on the historico-geographic tradition for the necessary data regarding the beginnings of Ionian science, since Aristotle clearly did not possess a copy of a book by Thales, if such a book ever existed. Regarding Anaximander's book Aristotle seems to have known little or nothing at first hand: his opinions regarding the Infinite and the reason why the earth keeps its central position he clearly did not understand, and in the latter case he certainly attributed to the Milesian an explanation utterly alien to his thought.[104] That Theophrastus perpetuated the blunder is certain and significant. Meanwhile the central interest of the early Milesians was ruled out as not germane to philosophy, and the best record of their thought derives from other branches of the tradition.

In conclusion let us attempt to frame a picture of this ancient book. In compass it cannot have been large, if the statement of Diogenes Laertius,[105] which in this particular is probably drawn from either Apollodorus or Posidonius, is true; for he reports that Anaximander gave "a summary exposition of his opinions." In spirit and intention it was historical, purporting to sketch the life-history of the cosmos from the moment of its emergence from infinitude to the author's own time, and looking forward to the death and dissolution not only of the earth and its inhabitants but also of this and all particular worlds. This being so the exposition naturally followed the order of chronological sequence, recounting first the origin of the world and of the earth, proceeding with the origin of life and the evolution of species capable of living on land as the once all engulfing sea gradually allowed dry land to appear, the origin of human life, probably in Egypt, and the spread of the race and its civilization. Heroic genealogies bridged the interval between the beginnings and the disposition of the peoples and their habitats in Anaximander's time, which were, however briefly, sketched in his book as well as figured on his chart. In this portion of his treatise, presumably, occurred some at least of the explanations which he gave of certain outstanding natural phe-

103 This is a thesis which I have long maintained and hope sometime to develop, that metaphysics begins with Pythagoras, Heraclitus and Parmenides. Its roots in mathematics and in the conception of the soul, which finds expression in the κύκλος γενέσεως, I have at various times pointed out, but not at length.

104 Aristotle, thinking in Pythagorean terms, speaks of spheres, whereas Anaximander's cosmography operates wholly with circles.

105 V^3 I. 14, 11.

nomena, such as earthquakes, and such strictly historical data as the old Milesian saw fit to give.[106] They would most naturally concern the royal houses, not improbably linked up with Heracles, of the great powers of Asia, the Lydians and the Medes.

Such a book, however significant to one whose antiquarian or broadly historical interest enabled him to detect in it the germs of future great developments, was of course destined to be speedily antiquated and thus ignored by the vulgar. The greatest wonder is that it did not disappear without a trace, as Theophrastus believed, probably with good reason, that many still earlier books had done; for until institutional libraries began to be formed in the days of Plato and Aristotle books, except such great favorites as the major poets, must have had an extremely precarious existence. The schools of philosophy took an interest in Anaximander's book in virtue of a part of its contents and because it was the earliest of its kind that came to their knowledge; geographers sought out, if not his authentic map, at least such information regarding it as might be gleaned from later writers in the same field; finally, at the very height of Alexandrian criticism, Apollodorus, qualified as no other was by training and interest to assess its worth, had the good fortune to retrieve it from obscurity, and the grace to use it in a way to reveal its true scope and character. The doxographic tradition, no doubt, called it a treatise *On Nature*, which sufficiently characterized it in part; someone possessed of a truer perspective, and regarding the whole book in the light of its conclusion called it a *Tour of the Earth*, unless — as is indeed possible — the distinctly geographical portion of the book had become detached from the beginning and so led for a time a life divorced, in which case the latter title may have been originally given to the separate part. In any case, the fortunes of Anaximander's book would seem to have been strikingly similar to the fortunes experienced by the work of his successor, Hecataeus.

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106 Hecataeus also, it seems, gave his historical (as distinguished from mythical and prehistoric) data in his Περιήγησις or Γῆς περίοδος; this at least is the opinion of Jacoby, and it is altogether probable, since the Γενεαλογίαι served to reconstruct the prehistoric period, and the Γῆς περίοδος, though concerned chiefly with describing the *status quo*, could not well, even if its author was primarily interested in geography, avoid touching on historical occurrences which affected the map. How intimately history and geography are bound up with one another must be clear to any thoughtful person, especially at the present moment.